

MARINE REVIEW.

VOL. XVI.

CLEVELAND, O., JULY 29, 1897.

No. 5.

Complaints from Vessel Captains.

Masters of lake vessels continue to submit to George L. McCurdy of Chicago, in the interest of underwriters, all manner of complaints about obstructions to navigation, abuses of rules, etc., and in a great many cases these communications, when turned over to government authorities and others, result in action being taken that is of advantage to the vessel interests generally. In a communication of recent date, Capt. W. E. Morris of the steamer M. B. Grover says:

"On the night of July 25-26 we met two boats in a fog. The first, which we met about 10 o'clock, was one point on our port bow. When we first heard three whistles from him, we checked down and answered with one whistle. He answered this single blast, but before we got another answer we had blown ten times. He was then abreast of us. Of course he knew where we were but we could not locate him. A second case of similar negligence occurred about 1:30 a. m., the same night. This steamer was about one point on our starboard bow. As soon as we heard him, we checked down, blew him two whistles and starboarded half a point. We blew two whistles a second time. He refused to answer this signal but continued blowing three whistles about every two minutes. He never answered our two whistles, and when he passed us we could see the reflection of his lights in the fog. And still people wonder at boats coming together! Men will, of course, make mistakes, but for this sort of thing there is no excuse. In order to find the men who will not live up to rules, I think it would be a good idea to offer rewards to members of the crew who will give information of negligence. Some extreme measures should be undertaken to cover these cases."

Capt. C. T. Brown of West Bay City makes a report which, it would seem, should have the attention of the United States engineer in charge of Tawas, (Mich.) harbor. He says that ten clusters of piles, driven in different parts of the bay at Tawas, are certainly obstructions that will eventually injure some vessel. "I have been informed," he says, "that these piles were driven by the Saginaw Bay Towing Association for the purpose of securing rafts. They are in 3½ and 4 fathoms of water and no lights are maintained on them. By what authority this was done, I do not know, but I hope and trust you will give the matter your attention. I ran in there in a gale for shelter, with a tow of barges, and fortunately it was daylight or I certainly would have been in trouble."

A naval display on a small scale will take place at Newport, R. I., Aug. 4. The occasion is the annual fete and illumination of the harbor of Newport, inaugurated three years ago in honor of the visit of the New York yacht club. Fete day at Newport will doubtless always hereafter be recognized as a feature of that delightful resort. The celebration increases in splendor each year. This year the vessels of the North Atlantic squadron to take part will be the flagship New York, battleships Indiana, Maine, Massachusetts, Texas and Brooklyn, the monitor Puritan and tender Fern, which, with the battleship Iowa and the torpedo boats already at Newport, will make the largest gathering of the new navy ever seen in New England. The crews of sailors and marines from these ships, joined by the Ft. Adams troops, the naval reserves of Rhode Island, and the local military will, on the afternoon of Aug. 4, participate in one of the most unique and imposing street parades ever witnessed in Newport or in fact any of the eastern cities. The electrical effects from the warships in the evening will be magnificent, including as they probably will the display made by the New York at Kiel and that made by the Brooklyn in honor of Queen Victoria at the recent naval review in England.

Luce's "Seamanship" is a book that is specially suited to assist young officers of the naval reserve. It is being used by naval reserve organizations all over the country. It is a standard work, selling at \$10, and will be mailed to any address at that figure by the Marine Review, 409 Perry-Payne building, Cleveland.

Lake Freight Matters.

Although the engagement of vessels to move wheat from Duluth to Buffalo in the fall, which began two months ago, was at first looked upon as purely speculative and confined to two or three big owners, it is quite probable that the amount covered for September and October delivery is much larger than was expected. The aggregate is thought to be in the neighborhood of 3,000,000 bushels, taken mainly by A. B. Wolvin of Duluth, Pickands, Mather & Co. of Cleveland, Capt. James Davidson of West Bay City and others. The great bulk of this grain has been covered at 2 cents for the latter half of September and 2½ cents for the first half of October.

Present conditions in the lake freight market generally are fully as discouraging as they have been for two months past, as vessel owners are meeting with great difficulty in securing ore cargoes at 50 cents from Lake Superior ports and 40 cents from Escanaba, with the Chicago grain market lower than it was a week ago, but hopes of an active fall trade are still entertained on account of the confidence with which prominent eastern interests talk of general improvement in business and the certainty of immense crops.

Lighting of Grosse Point Channel.

Vessel captains generally are probably not aware of the fact that the present light structures, as well as the lights, on Grosse point cut, Lake St. Clair, are only temporary. They will be replaced as soon as possible by permanent lights of a substantial kind. There is an excuse, therefore, for numerous complaints about this channel not being well lighted. Several captains have suggested that even under the present temporary arrangements there should be some distinguishing mark at the lower end of the cut, as only a white light is shown now, and this is so similar in character to other lights in the vicinity that it is difficult to make the turn safely into the cut. These captains are of the opinion that a red light placed over the white light at the south-east end of the cut would be of great assistance in making the channel. The matter has been submitted to Commander Folger of Detroit, who is in charge of the light-house district in which the Grosse point cut is located.

Mr. W. A. Livingstone of Detroit, who has for several years past been regarded as one of the most popular young men connected with the vessel interests of the lakes, has resigned the position of joint agent for the Anchor Line and Western Transit Co. at Detroit, and the managers of the transit companies have decided to give the place on Aug. 1 to Mr. P. E. Bourke, who has been Mr. Livingstone's assistant. Mr. Livingstone has been offered the management of the Photochrom Co. of Detroit, which controls certain valuable photo-color processes for this country, and which is getting ready to build a factory in Detroit. As this necessitated a trip to Europe soon, and later will require all of Mr. Livingstone's attention, he concluded to resign now and take a little time for improvement in health. Prints from the photo-color process for which the Detroit company has secured patent rights in this country are at present made only in Zurich, Switzerland. It is a style of color pictures that are said to surpass in quality the finest lithographs.

Mr. Charles A. Conant, of the New York Journal of Commerce, contributes to the Review of Reviews for August an admirable exposition of the new tariff law. His article is intended to tell the business man what we may expect from the operation of the new schedules. So much of the newspaper discussion of the Dingley bill has been warped by partisanship that the ordinary citizen is at a loss to know the real animus of the measure or its probable bearings on individual and general interests. Mr. Conant writes with moderation and candor; his article is calculated to enlighten the public on a topic that requires first of all impartiality in treatment.

The Review has excellent photographs of lake ships.

BRITISH HOSPITALITY.

HOW THE SHIP BUILDERS OF ALL NATIONS WERE ENTERTAINED BY THEIR PROFESSIONAL BRETHREN OF ENGLAND AND SCOTLAND—EXCURSIONS TO THE GREATEST DOCK YARDS AND SHIP BUILDING PLANTS OF THE WORLD—ENTERTAINMENTS ON A MAGNIFICENT SCALE.

London, July 12.—It would be difficult to imagine a series of entertainments more elaborate than those provided in England and Scotland for the guests of the Institution of Naval Architects. From the programme, contained in a previous letter, only a meager idea can be formed of the magnificent scale on which the excursion to Windsor, the several dinners and concerts at London's leading resorts for aristocracy, and the visits to dock yards and other places of interest to ship builders, have been carried out. The invitation from the queen to visit Windsor, and the fact that the Prince of Wales acted as honorary president at the opening of the congress, are matters indicating the importance of the occasion and the influence of the men of this country connected with the ship building industry. Receptions tendered by the Lord Mayor, by Lady White, the wife of the director of naval construction, and by Mrs. Goshen, wife of the first lord of the admiralty, may also be regarded as special acknowledgements of honor attending the profession of naval architecture.

In this congress, which was in reality two weeks of pleasure excursions, (only parts of two days were given to discussion of papers), the British institution spared nothing in return for hospitality extended by their colleagues in Germany last year and previously in France. The American representatives were few in number, but they were given unusual attention at the several principal entertainments and in the meetings devoted to discussion of professional papers. In his opening address at the first meeting, Lord Hopetoun, the president of the Institution of Naval Architects, who is credited with planning the international congress, paid a compliment to the visitors from America by saying that "to the inventive genius of the people of the United States steam navigation owes very much in its application both to war and peace. The construction of the Monitor was an ever memorable event in naval annals, and taught all maritime powers a lesson which they hastened to take to heart." In this same address it was stated that in sixty years British shipping has grown from 3,000,000 tons to 15,000,000 tons, and the value of imports and exports have risen from \$485,000,000 to \$3,650,000,000, both of which items of increase are worthy of most serious consideration from the politicians of the United States who refuse to give consideration to the shipping question.

NUMEROUS GRAND ENTERTAINMENTS.

At the first of the banquets in London, which was held at King's Hall, Holborn restaurant—a place that would cause the average mortal to look around him and wonder if Rome in its greatest period ever had anything grander—General Hyde of Bath, Me., was accorded the privilege of responding for the United States. Lieut. J. C. Colwell, United States naval attache, Naval Constructor D. W. Taylor, Mr. W. M. McFarland of the engineer corps and Mr. Charles Cramp, as well as Mr. C. H. Haswell, ex-chief engineer of the United States navy, were given places of honor. The company included the Japanese minister and numerous officers of high rank from navies of all of the maritime powers, together with men of distinction from marine departments of the different countries and from leading maritime bodies of all Europe. Mr. Goshen, who proposed the toast of the evening, "Our Guests," said that on few occasions were so great a brain power represented. Naval architecture was concerned with all classes of ship building and marine engineering. Solitary students worked out the theories which were invaluable to the practical constructor, and every stage of the process, from its inception in the brain to the actual building, was there represented. Genius recognized no class distinction, and the humblest apprentice had his chance of showing what was in him. As on a previous occasion, Mr. Goshen expressed the hope that whatever might be the discoveries of the naval architects they would not discover anything that would condemn the ships of the present fleet to the category of obsolete types. Mr. Goshen also addressed the guests in French and German. Admiral Bende-mann of the German navy said that the emperor, when he left Kiel, sent a special message of kindness and good will to the institution. M. Normand, vice president of the Association Technique Maritime of

France, Admiral Duperre of the French navy, and Gen. Hyde for the United States, all offered congratulations and referred in flattering terms to the hospitality of the institution. Gen. Hyde said:

"My Lords and Gentlemen—My only regret on this happy occasion is that Mr. Griscom, president of our society, is compelled to be absent. He could have responded to this toast so much more worthily. The hearty welcome you have given us, the kind hospitality you have shown us, will long linger in our memories. Our hearts were already warm toward the mother country. We have seen many things to interest us here. Not the least important is to learn how the great heart of England goes out toward her navy and her merchant marine. We have learned how the will of a great people, largely entrusted to members of your society, has produced your magnificent fleet, which by a seeming paradox, may be a promoter of peace while it is an engine of war. We can learn, as Lord Hopetoun so well expressed it, 'that England claims no monopoly in the art and improvement of ship building.' Gentlemen, in behalf of your kindred American society, I thank you."

The festival concert at Queen's Hall, London, with an orchestra of 110 members of the Royal College of Music and a chorus of 235 voices; the dinner at the "Star and Garter" hotel, Richmond, following which the valley of the Thames was lighted up with colored fire and a great glare of fireworks from the meadows in front of the hotel, together with succeeding festivities, were all of the grandest order imaginable. Few of the several hundred delegates to the congress missed any of these entertainments, and the arrangements for trains, luncheon enroute, comfort on steamers while visiting the various docks, etc., were admirably carried out, especially in view of the large number of visitors. Books of coupon tickets of admission were furnished to the guests, and these with neat badges, which designated both members of the institute and the delegates, served to simplify all parts of the programme.

READING AND DISCUSSION OF PAPERS.

As it was intended that the delegates to this congress should be royally entertained and also afforded an opportunity to see the principal docks and ship building establishments of England and Scotland, not much time was given to the professional papers, but the list of gentlemen taking part in the discussion certainly represented a great array of talent, as it included such eminent authorities as Sir Edward Reed, Sir John Durston, Dr. Elgar, Sir William White, Prof. J. H. Biles, Sir N. Barnaby, Mr. Archibald Denny, Mr. John I. Thornycroft; Mr. G. W. Manuel, chief engineer superintendent of the Peninsular & Oriental Steam Navigation Co.; Mr. J. T. Milton, chief engineer surveyor, Lloyds Registry; Mr. Charles E. Ellis, managing director of Sir John Brown & Co.; M. Emile Bertin, director of naval construction, and M. Normand of France; Mr. Charles Cramp, Gen. Hyde, Naval Constructor Taylor, Mr. W. M. McFarland, engineer, U. S. navy, and many others whose names are familiar to everybody who is in any way connected with the building of ships. The list of papers, some of which will find space in the Review later on, is as follows:

"Hardened Armor Plates and Broken Projectiles," by M. Emile Bertin, director of naval construction, France; "Non-flammable Wood," by Mr. C. Ellis, managing director of Sir John Brown & Co.; "On the Advancement of the Mathematical Theory of Naval Architecture During the Existence of the Institution of Naval Architects," by Sir Edward Reed; "Danish Steam Ferries and Ice Breaking Steamers," by Capt. I. C. Tuxen, director of naval construction and engineering, Royal Danish navy; "On Graphic Aid in Approximating Hull Weights," by Mr. J. Johnson of Gottenburg; "A Review of the History and Progress of Marine Engineering in the Royal Navy and Mercantile Marine from the Foundation of the Institution of Naval Architects to the Present Day," by Sir John Durston, engineer in chief of the British navy and by Mr. J. T. Milton, chief engineer surveyor of Lloyd's Registry of Shipping; "Water Tube Boilers in High Speed Ocean Steamers," by Mr. Pierre Sigandy; "Experimental Investigation of the Nature of Surface Resistance on Ships and in Pipes," by Prof. Hele-Shaw; "The Formation of Cavities in the Water by Screw Propellers at High Speeds," by Mr. Sydney Barnaby.

The most important of these papers are, of course, the two dealing with the history and progress of marine engineering and with advances made in the mathematical theory of naval architecture during the past forty years. Both are by Englishmen who are regarded among the foremost men of the present day in the ship building world and who are themselves worthy of a great deal of credit for

the advances made within the period of which they write. The papers will therefore be read with great interest in all parts of the world. "The whole mathematical theory of naval architecture," says Sir Edward Reed in concluding his paper, "is in all its parts a domain in which the mind might expatiate with delight amid the charming complexities and fascinating intricacies of ideal science, knowing that as we became extricated from these intricacies and complexities, and brought into view the simple laws that had occasioned them, our greatest mental qualities could find their highest satisfaction. From the same domain we gathered the practical laws which so informed and regulated our professional work as to give increasing security to our sea structures, and seemed to justify the hope that in the days to come no structure, however solidly founded upon the land, need surpass, either in strength, or safety, or beauty, the structures which the naval architect would offer to the use and admiration of the world."

The Visit to Scotland.

PREPARATIONS IN THE HOME OF NAVAL ARCHITECTURE AND MARINE ENGINEERING FOR A REPETITION OF THE PROGRAMME CARRIED OUT IN ENGLAND.

Glasgow, July 15—Nearly all of the delegates to the International Congress of Naval Architects and Marine Engineers took advantage of the opportunity to visit the Clyde ship yards, and some 400 of them are now in Glasgow. They were provided with a special train which made the run from London over the Great Northern Railway in daylight. The American delegates are unable to find words to express their delight with the most hospitable and cordial entertainment that has been tendered them in and around London. Any one of the several excursions that have taken place during the past week would have been a sufficient return for the trip across the Atlantic. Nothing could exceed the generosity with which the guests of the Institution of Naval Architects were treated at Windsor and Richmond, as well as on the trip to Portsmouth dock yards and Southampton, and now there is to be a repetition of the same cordial greeting in Scotland.

PROPOSING A VISIT TO THE UNITED STATES.

Before leaving London, General Hyde of the Bath Iron Works, ventured to suggest the possibility of an invitation being extended to the institution to visit America, probably in the course of a year or two, and Lord Hopetoun answered that he would very probably join a party from England in event of such an invitation from the American society. It would certainly tax the best efforts of our leading naval officers and ship builders to provide an entertainment anything like that which has been going on here, but General Hyde, Mr. Cramp and other representatives from the United States are of the opinion that a similar congress in America could be made successful if undertaken with the proper spirit, and that a gathering of men of different nations interested in shipping would prove advantageous to our country. A visit from Lord Hopetoun to America would undoubtedly prompt a large attendance of other members of the society from England and Scotland. He is very popular and is a good representative of the active young men among the aristocracy of this country. The engineer-in-chief of the Royal Navy, now Sir John Durston, also seems to be very popular, largely on account of the bold stand he has taken in the adoption of water tube boilers for the largest ships of war. His appearance at these meetings, immediately following the honor conferred upon him by the queen, has been greeted by hearty applause when occasion warranted it and by favorable comment regarding his engineering ability.

In my first letter I neglected to mention among the delegates from the United States, Naval Constructor Woodward and Mr. J. S. Andrews of the Bath Iron Works. As a representative of the United States navy, Mr. Woodward was asked to join in the discussion attending the reading of papers in London, and he added some valuable information to the paper on "Non-Flammable Wood," presented by Mr. C. Ellis. He inspected the construction of three gunboats built at Newport News, in which all of the wood had been treated by a process corresponding with that described in Mr. Ellis' paper, and his remarks on the subject were therefore of special interest.

I referred only casually in previous letters to the reception given by the queen at Windsor Castle. Such an omission would be an unpardonable offense among the people who fairly worship Her Majesty. But aside from the great importance attached by the home members of the congress to the invitation to visit Windsor, the reception was really a grand and impressive affair. The visitors at Windsor num-

bered fully 600, as many of the home members of the institution with their wives took advantage of the special opportunity afforded to see the queen. As on all other occasions special trains were provided, and on arrival at the castle between 3 and 4 o'clock in the afternoon of a very pleasant day the large party was received by Lord Edward Pelham Clinton, master of the household. The state apartments and garden opposite the drawing rooms were open to the company, who afterward assembled upon one of the lawns. The queen, accompanied by Princess Henry of Battenberg and the Grand Duke and Grand Duchess of Hesse, presently drove in an open carriage through the grounds, passing up and down a road of about 12 feet in width, on either side of which the visitors were assembled. The carriage halted for a few minutes while the names of distinguished representatives of the different countries were spoken to the queen by Lord Hopetoun. In this ceremony Naval Constructor D. W. Taylor was accorded the honor of representing the United States. The following list of representatives from other countries who were presented to the queen will give an idea of the extent of representation in the congress: Argentina, Commander Betheder; Austria-Hungary, Commander Sztranyasszky; Belgium, Monsieur Lecointe; Chili, Rear-Admiral Wribé; Denmark, Capt. Tufen; France, Vice-Admiral Charles Duperre and Monsieur L. de Bussy; Germany, Rear-Admiral Bendemann and Herr A. Dietrich; Holland, Rear-Admiral Stockhuysen; Italy, Chevaliere Bianco, China, the naval attache; Japan, Capt. Yendo, naval attache; Norway, Capt. Moerch; Russia, Capt. Grigorovitch; Spain, General Comerma; Sweden, Count Morner. Refreshments for the assembly were served later in the Orangery.

PORTRUSH DOCK YARDS.

A flying tour of Portsmouth dock yard with its area of 293 acres of dry docks, large basins, machine shops, foundry, smithery, berths for the construction of ships, etc., is almost equal to a jubilee naval display in convincing the average visitor of the immensity of the British fleet and all that pertains to its maintenance. On the trip from London to Portsmouth and Southampton, which was made in special trains, the delegates were accompanied by Sir William White, director of naval construction, and Sir Edward Reed, who held the same post during the naval transition from wood to iron. A large number of members of the reception committee were also in the party and they spared no pains in explaining the objects of interest. A first-class battleship, the *Canopus*, which was laid down in January last, and which is already well along towards the launching stage, was inspected. Close by were several of the torpedo boat destroyers which have recently been employed in tactical exercises. These engaged considerable attention, as did also another battleship of the first-class, the *Cæsar*, which is in dock preparing for her steam trials. In the torpedo stores the internal fittings of some of these destructive missiles were explained. But to the American visitor the massiveness of stone construction in every part of the great dock yard is most impressive. He has seen the best of modern ships at home, but he marvels at a total of some eighteen stone dry docks, ranging in length from 250 to 648 feet, and half a dozen ship basins having areas of three to twenty-two acres—all within one great enclosure and all built to last for ages. The part of this immense plant which formed the original dock yard in 1540, during the reign of Henry VIII., was especially interesting, as were also the latest docks—565 by 94 by 42 feet—in which the *Powerful* and *Terrible* were recently docked. The water can be pumped out of each of these docks by pumps at the central pumping station of the yard in four hours. The whole of the gear for the capstans, pentstocks and some of the cranes belonging to the docks and basins, and also the sliding caissons, is worked by compressed air. Any of the several hundred visitors might devote with profit several weeks to a study of methods and appliances for ship building and ship repairs at this dock yard, but they saw in a few hours only a little of what was worth looking at when another feature of the programme of pleasure, a cruise between the main land and the Isle of Wight, was taken up. The vessel was the *Mexican*, (4,661 tons), which had been placed at the disposal of the members of the congress by the directors of the Union Steamboat Co. On account of late arrival at Southampton, an inspection of the docks at that point was not undertaken, but again the comfort of the guests was looked after by a special train being provided for the return to London.

STUDENTS OF NAVAL ARCHITECTURE IN GLASGOW.

Professor Biles of the Glasgow University, who is very well known as a naval architect in the United States, is attending the con-

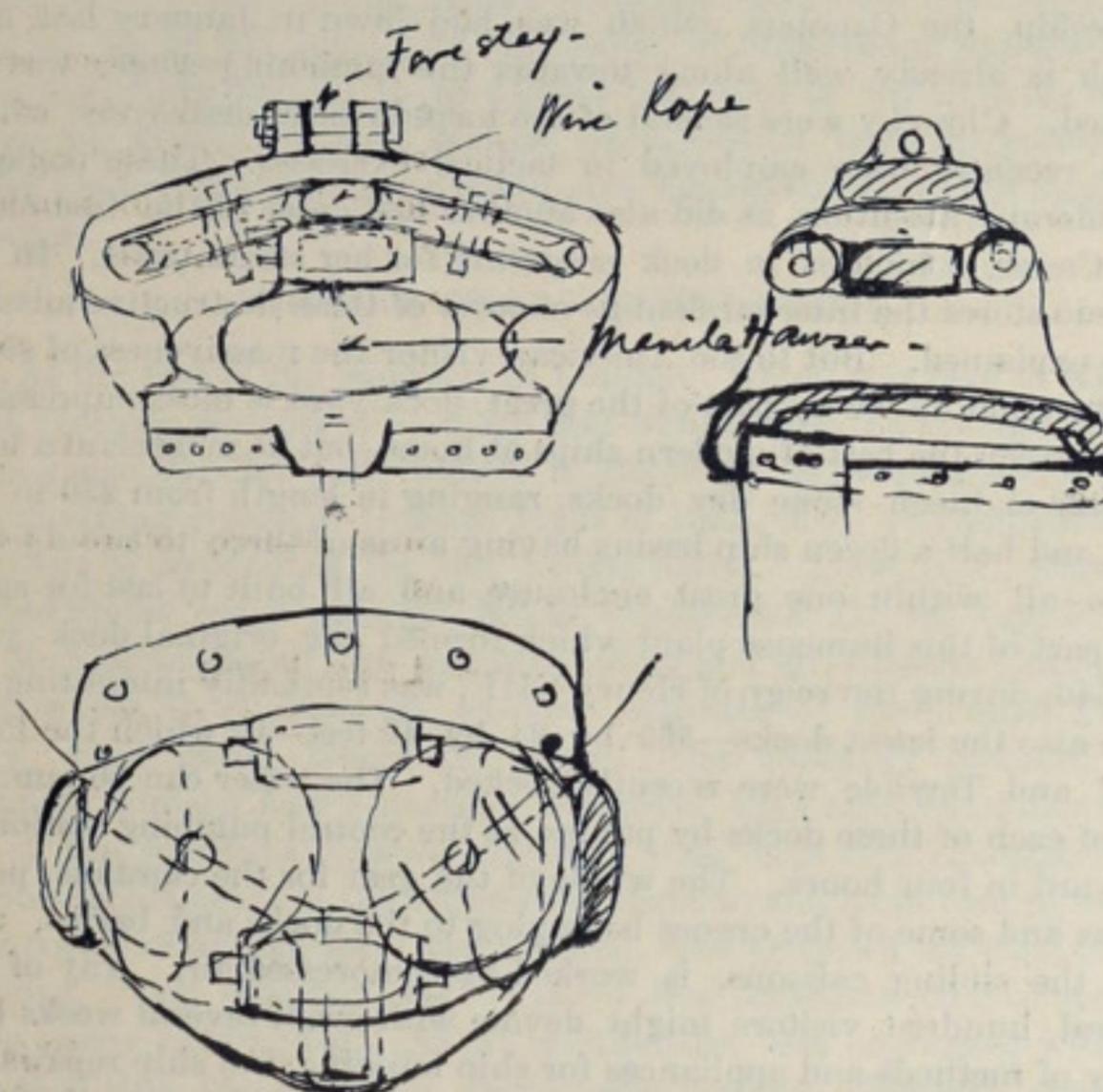
gress, and on the several excursions he took occasion to renew acquaintances with the American delegates. Mr. James Swan and Mr. Austin Sperry, two students of naval architecture "from the states," as they say here, were also in the American party. These young men, who attended Professor Biles' lectures during the past year, speak very highly of him, and they are also very earnest in their praises of the Glasgow school, as regards the practical knowledge which they secured. There was quite a little colony of American students in Glasgow during the winter. The list included W. G. Grossbeck of Cincinnati, L. S. Adams of Concord, Mass., H. A. Evans of Florida, R. H. M. Robinson of Ohio, James Swan of Boston, M. H. McGann of Philadelphia, E. S. Alexander of York, Pa., W. A. Fairbairn of Bath, Me., H. N. Whittelsey of Minneapolis and Austin Sperry of San Francisco. The four first named are naval cadets. All of the others are young men who are expecting to find positions in American ship yards. Some of them will return next winter and will probably take private instructions from Prof. Biles, as has been the case with several of them during the past year. But the Glasgow school is not of the kind that furnishes the higher order of technical training suited to our young naval constructors, and now that the British government has closed the Royal College to outsiders, it is more than probable that funds will be provided to carry out Secretary Long's plan of educating our young naval officers in this line at home, probably at Annapolis.

In another letter I will tell of the excursions to Clyde, and of the impression which this visit to the home of ship building has left with our naval officers and with other representatives from the United States.

J. M. M.

Design of Chocks for Tow Lines.

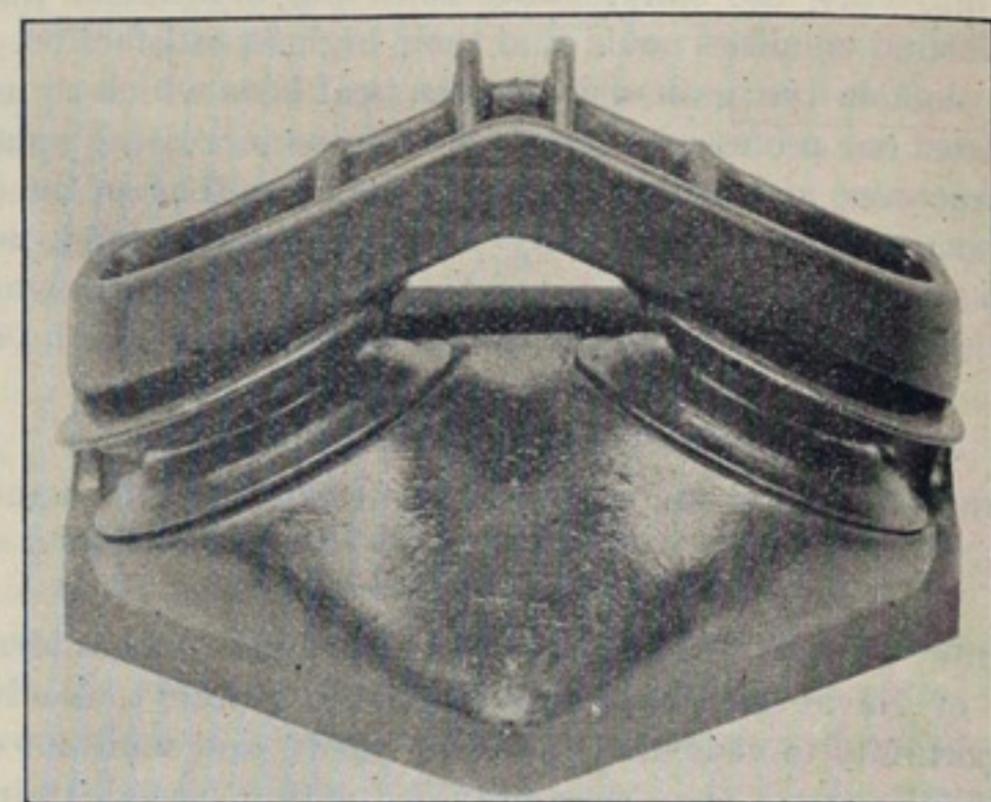
Editor Marine Review:—In your issue of July 15 I notice a letter from my esteemed friend, Mr. John Haug, claiming credit for having originated the design of bow chock illustrated in your issue of July 8, and which was attributed to myself. While the matter is really very trifling, it would be well, in justice to myself, to place your readers in a clear light on the subject. The sketch which I send you is the identical sketch Mr. Haug refers to as having been made by himself and then forwarded to Mr. H. G. Dalton. I would ask any fair-minded



MR. HAUG'S SKETCH.

man if there appears to be a great similarity between this sketch and the chock designed by myself, and whether it would appear that the latter was the outgrowth of the former. Concerning the sketch, it would be well to note that it was made immediately after a discussion on chocks between Mr. Haug and myself, in which I stated that, were it not for a few objectionable features, a "double decker" might be arranged with a place for wire tow-line above that for manilla. It would be hard, indeed, to design a chock containing rollers and sheaves that was not in some way similar to other chocks in use, and my idea in designing this chock was not to gain notoriety but to get up something with rollers properly placed, scored sheaves at the re-

quired angle, and suitable frame work and fastenings that would thoroughly fill the bill for the purpose intended. The only chock now in use of the kind illustrated in your issue of July 8 is on the Standard Oil Co's barge No. 81, and the only others like it in use in the Bessemer company's fleet are those fitted to the Nasmyth and Bell. The pattern for these was most certainly designed by myself,



VIEW OF FINISHED CHOCK.

and that fitted to the oil barge embodies improvements carried out by myself over the earlier pattern. The way of the "bow chock designer" is hard, and my advice to any one who is thinking of entering the already numerous list is to look for some "new" material and other fittings than rollers and sheaves to construct from.

West Superior, Wis., July 22, 1897.

D. E. Ford.

Around the Lakes.

Engineer-in-Chief John W. Collins has been appointed captain of engineers in the revenue cutter service.

The tug America, built by the Union Dry Dock Co. at Buffalo for the Erie Tug Line of Erie, was launched Wednesday. She is 85 feet long and has great power.

Capt. Bernard Nelson will command the steamer Globe, which was unfortunate enough, however, to go ashore right in Waitski bay before he was ready to take charge of her.

Three new gas buoys have been stationed at points on the St. Lawrence river. One a red buoy showing a fixed white light, is on the westerly side of the channel entrance to Ogdensburg harbor; a second, painted black and showing a flashing white light, marks the westerly end of the reef making off from Rock island, and is about 600 feet W. S. W. from Rock island light-house, the third, red and black striped with a fixed white light, is on the southerly side of Charity shoal, about 3½ miles S. E. ½ E. from Pigeon island light-house.

Breyman Bros. of Toledo, who have in hand a big contract for dredging Boston harbor, have purchased two large tugs to be used in connection with dredges and scows which they are having built in the east for the work. The tugs were purchased from New York parties and are each 90 feet long. Their names are B. T. Haviland and E. Heipershausen. The former is fourteen years old and the latter ten years old. Both have steeple compound engines, one of which is 19 by 38 inches with 26 inches stroke and the other 19 by 36 inches with 22 inches stroke.

Statistics prepared by the American Iron & Steel Association show that the total production of pig iron in the United States in the first half of 1897 was 4,403,476 gross tons, against 4,976,236 tons in the first half of 1896 and 3,646,891 tons in the second half of 1896. As compared with the first half of 1896 there was a decrease in the first half of 1897 of 572,760 tons, but as compared with the second half of 1896 there was an increase of 756,585 tons.

A Niagara Falls excursion via the Nickel Plate road, Thursday, Aug. 5. Special train leaves at 10:00 p. m. Sleeping cars attached. \$3.00 for the round trip.

244, Aug. 5

Army and navy charts of the lakes are kept in stock by the Marine Review, Perry-Payne building, Cleveland.

Excessive Speed in Narrow Channels.

Underwriters who have a large share of lake insurance this season are certainly taking advantage of every possible opportunity to protect their interests by trying to secure co-operation from vessel owners and captains in matters tending to avoid collisions, strandings, etc. Under date of July 27, George L. McCurdy of Chicago writes Capt. Geo. P. McKay of the Lake Carriers' Association as follows:

"I had a talk with Capt. Gibson of the steamer Chili to day. He says that last year while he was commanding the steamer Brazil, and while he was in the vicinity of Duff & Gatfield's dock, Amherstburg, a vessel passing him drew away the water so that he struck four times, incurring large expense. He seems to think that there should be some control exercised over this part of the Detroit river, as it is fully as important as the Sault river where a patrol is maintained. He says also that if vessels would only check down in such places there would be no danger of the suction drawing the water away and causing deep-loaded vessels to strike. This seems to be a matter that should be presented to the Lake Carriers' Association and instructions given to captains, as we find the vessels are loading to the last inch of the available water, and where one runs by the other at places of this kind the inevitable consequence will be striking and damage. If owners will instruct their masters to be prudent, their action may prevent loss from accidents, and will cause little loss in time. I write to you feeling that the owners, if this matter is brought to their notice, will see that it is of importance and instruct their captains accordingly."

It would seem that a remedy for carelessness of the kind referred to by Mr. McCurdy in the foregoing letter is fully provided for in amendments to the rules of the steamboat inspection service, which were adopted some time ago after the Lake Carriers' Association had fully discussed the question of speed and the passage of vessels in narrow channels everywhere throughout the lakes. It would seem that the case in point would be fully covered by a complaint lodged with the steamboat inspectors against the offending captain, as the following extracts from the pilot rules for the lakes are intended to cover all such offenses in narrow channels, both for vessels going in the same direction and vessels going in opposite directions.

"When steamers are running in the same direction, and the pilot of a steamer which is astern shall desire to pass on the right or starboard hand of the steamer ahead, he shall give one short blast of the steam whistle as a signal of such desire and intention, and shall put his helm to port; or if he shall desire to pass on the left or port side of the steamer ahead, he shall give two short blasts of the steam whistle as a signal of such desire and intention, and shall put his helm to starboard, and the pilot of the steamer ahead shall answer by the same signals, or if he does not think it safe for the steamer astern to attempt to pass at that point, he shall immediately signify the same by giving several short and rapid blasts of the steam whistle, and under no circumstances shall the steamer astern attempt to pass the steamer ahead until such time as they have reached a point where it can be safely done, when said steamer ahead shall signify her willingness by blowing the proper signals. The boat ahead shall in no case attempt to cross the bow or crowd upon the course of the passing steamer.

"In the navigable channels on the great lakes and their tributary and connecting waters less than 500 feet in width, no steam vessel shall pass another going in the same direction unless the steam vessel ahead be disabled and signify her willingness that the steam vessel astern shall pass; when the steam vessel astern may pass at a rate of speed not exceeding five miles per hour.

"When steam vessels running in opposite directions are about to meet in such channels, both such vessels shall be slowed down to a speed not exceeding five miles per hour.

"In such channels the descending steam vessel shall have the right of way. The pilot of such descending steamer shall signify his desire and intention by giving the proper signal before the steamers have arrived at a distance of one half mile of each other."

The Marine Review has prepared in neat oak frames cards containing the schedule of time required to be run between certain points in the St. Mary's river under the speed limit of seven miles an hour. When hung in a pilot house, distance and time may be readily noted from these cards, as the type is large. They will be sent by express to any address at \$1 each, or may be had upon application at 409 Perry-Payne building, Cleveland, for 65 cents each.

An Immense Floating Dock.

In a letter to the state department, Mr. W. Henry Robertson, consul at Hamburg, describes an immense floating dock, which was recently completed at the works of Messrs. Blohm & Voss, ship builders of Hamburg. Mr. Robertson says:

"This new dock has a carrying capacity of 17,500 tons. Its length, with the pontoons, is 624 feet 4 inches and its width 118 feet 1 inch. It is able to raise the largest merchant vessels that have thus far been built, and even the heaviest men-of-war, and consists of seven separate pontoons with high and strong side pieces. These seven pontoons can be joined together, so as to form one connected system. Each side piece contains an engine and boiler room for the pumps and electric hydraulic machines. These two machines drive fourteen pumps, which are capable of pumping out the dock in forty-five minutes. In order to regulate the raising and the lowering of the dock, it was necessary to divide each pontoon into several watertight compartments, which are closed by means of stop valves. All these stop valves can be moved from one point by means of hydraulic power, and the depth of water in all compartments is indicated by special apparatus. By this arrangement, it is possible for one person to manage all the stop valves and to direct the pumping. The blocks upon which the vessel rests are easily movable by machinery from the side pieces. The dock harbor has a depth of 26 feet 2 inches below O, so that, at ordinary high tide, vessels drawing as much as 26 feet can be docked. Next to the pontoon and on the quay of the ship yard, there is a huge crane, which, when projected 65 feet, can raise 150 tons and 45 tons when projected 106 feet. By means of this crane, heavy loads can be transferred directly from the shore into the dock across the largest vessels. Owing to its peculiar construction, this great dock can, in cases of emergency or in time of war, be transferred to Brunsbuttel, at the opening of the Kaiser Wilhelm canal, to dock vessels which have sustained heavy damages or whose draft is great. As a matter of fact, it is capable of docking vessels with a draft of 29 feet 6½ inches. No vessel with a greater draft than 27½ feet has thus far succeeded in coming up to the port of Hamburg."

United States Revenue Cutters.

Another of the new United States Revenue cutters, the Daniel Manning, built by the Atlantic Works of East Boston, has had a trial, and has proven fully equal to the best of the several new ships of this service. During the past five years appropriations have been secured from congress for ten new vessels for the revenue cutter service, their cost aggregating about \$1,500,000. On a short run the Manning during her trial attained a speed of 16.94 knots, and for four consecutive hours her speed was 15.08 knots. She is a cutter of the first class. Her triple expansion engines develop about 2,000 horse power. She has an entire outfit of Blake pumps, including main and auxiliary feed pumps, fire pump, water service pump, bilge pump, and also the Blake vertical system of twin air pumps for the main condensers. These air pumps gave the same remarkable economy to similar pumps on the United States cruisers and battleships, namely about $\frac{1}{2}$ of 1 per cent. of the I. H. P. of the main engines.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, July 24, 1897:

	Wheat, bushels.	Corn, bushels.
Chicago	3,525,000	6,662,000
Duluth	808,000	11,000
Milwaukee	109,000	3,000
Detroit	13,000	29,000
Toledo	302,000	335,000
Buffalo	751,000	495,000
	5,508,000	7,535,000

As compared with a week ago, the above figures show, at the several points named, an increase of 161,000 bushels of wheat and a decrease of 916,000 bushels of corn.

The Cleveland Brass Mfg. Co., manufacturers and founders of all kinds of brass, copper, bronze and aluminum, has opened an office in the Perry-Payne Building, Cleveland. They make a specialty of metal patterns. Lake engine builders may profit by writing them for prices.



DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio,
by John M. Mulrooney and F. M. Barton.SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient
binders sent, post paid, \$1.00. Advertising rates on application.

Entered at Cleveland Post Office as Second class Mail Matter.

The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross
		Tonnage.
Steam vessels.....	1,792	924,630.51
Sailing vessels and barges.....	1,125	354,327.60
Canal boats.....	416	45,109.47
Total.....	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30, 1891	204	111,856.45
" " " 1892	169	45,968.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
" " " 1895	93	36,352.70
" " " 1896	117	108,782.38
Total.....	864	414,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canals.			Suez Canal.		
	1896*	1895*	1894	1896	1895	1894
Number of vessel passages.....	18,615	17,956	14,491	3,409	3,434	3,352
Tonnage, net registered.....	17,219,418	16,806,781	13,110,366	8,560,284	8,448,383	8,039,175
Days of navigation.....	232	231	234	365	365	365

*1895 and 1896 figures include traffic of Canadian canal at Sault Ste. Marie.

In a letter to the Review, Major Thomas W. Symons of Buffalo, whose recent report to the war department on the subject of a ship canal from the lakes to tidewater has attracted a great deal of attention, says that he is very desirous that everybody who takes an interest in the matter should have the full report to consider, rather than any garbled or incomplete abstracts therefrom, in order that his reasons for the judgments rendered should be fully understood and appreciated. From what is known on the lakes of the labor involved in preparing this report it is certain that the summaries sent out from Washington were of a very meager kind. They made no reference to the collection of facts gathered from lake vessel owners, shippers, ship builders and others, and which, together with estimates of the great cost of a canal wholly within the United States, were the reasons for Major Symons' conclusion that "the project was not one worthy of being undertaken by the general government, as the benefits to be derived therefrom would not be properly commensurate with the cost." It will be well, therefore, for those who are interested in this subject to secure the full report, which can be obtained through members of congress or from the war department. It is the only document dealing with the tidewater-canal proposition that contains opinions from practical vessel owners of the lakes.

American ship builders, as well as the heads of engineering concerns of all kinds throughout this country, have reason to watch with considerable interest the effort that is now being made by labor organizations representing the engineering trades to establish an eight-hour day throughout England and Scotland. The question to consider is the bearing which the struggle on the other side of the Atlantic will have on the workmen of this country. Should the workmen of Great Britain succeed in their efforts to bring about an eight-hour day, the cause would undoubtedly be greatly strengthened on this side. In the midst of the greatest prosperity ever known in England the workmen threw down their tools with the demand for eight hours. Their organization is probably stronger than anything of its kind in this country, and a bitter struggle, with advantages on both sides, is on. Just now prosperity is looked for in our own country, and it is unfortunate that in event of the English workmen succeeding in this fight, its influence will be towards further labor disturbance here.

The talk of using turbine engines in two vessels which the Richelieu & Ontario Navigation Co. propose to build for passenger service on the St. Lawrence river is not well founded. Mr. Frank E. Kirby of Detroit, who has been consulted by the managers of the St. Lawrence passenger boat service, has shown a great deal of interest in turbine engines since they have been applied to a British torpedo boat, but it is not at all probable that he would, at this early stage of the application of the turbine principle in ships, attempt such a bold move as to recommend the adoption of it in a St. Lawrence passenger steamer. It would seem, anyhow, from opinions expressed by the best English engineers, that novelty rather than real merit has caused most of the talk about "revolution in marine engineering" on account of the turbine.

Few changes of importance to the lakes have been made in committees for the next session of the house of representatives, as announced by Speaker Reed a few days ago. Mr. Hooker of New York, who was mindful of the interests of the port of Dunkirk in the last congress, retains the chairmanship of the committee on rivers and harbors, and Mr. Burton of Ohio (Cleveland) also retains a place on this committee. Other members of the committee on rivers and harbors from lake states are Walter Reeves of Illinois, Roswell P. Bishop of Michigan and Page Morris of Minnesota. Mr. Corliss of Detroit is a member of the committee on interstate and foreign commerce, of which William P. Hepburn of Iowa is chairman.

If the American Steel Barge Co. is to build, according to newspaper statements, three or four small steel vessels for use in the Alaska gold region, the officers of the company do not seem to know much about it, as a letter from one of them, just received, says they have nothing new on hand excepting the work of boring for a new dry dock, which is to be 500 feet on the keel blocks and 60 feet wide at the bottom.

Escanaba is pulling hard for a weather bureau station. As she has been for several years the largest iron ore shipping port in the world, the government ought to supply her need.

Amendments to Shipping Laws in New Tariff.

A letter from Mr. Eugene T. Chamberlain, United States commissioner of navigation, informs us that the new tariff amends the following two general provisions of the laws relating to shipping as indicated by the parts in italics:

"Sec. 14. That all articles of foreign or domestic production needed and actually withdrawn from bonded warehouses and bonded manufacturing warehouses for supplies (not including equipment) of vessels of the United States engaged in foreign trade, or in trade between the Atlantic and Pacific ports of the United States, may be so withdrawn from said bonded warehouses, free of duty or of internal-revenue tax, as the case may be, under such regulations as the secretary of the treasury may prescribe; but no such articles shall be landed at any port of the United States."

"Sec. 22. That a discriminating duty of 10 per centum, ad valorem, in addition to the duties imposed by law, shall be levied, collected, and paid on all goods, wares or merchandise which shall be imported in vessels not of the United States, or which being the production or manufacture of any foreign country not contiguous to the United States, shall come into the United States from such contiguous country; but this discriminating duty shall not apply to goods, wares or merchandise which shall be imported in vessels not of the United States, entitled at the time of such importation by treaty or convention to be entered in the ports of the United States on payment of the same duties as shall then be payable on goods, wares and merchandise imported in vessels of the United States, nor to such foreign products or manufactures as shall be imported from such contiguous countries in the usual course of strictly retail trade."

The following special trains have been chartered to leave Cleveland for picnic resorts on the Nickel Plate road on dates indicated; Thursday, July 29, German Evangelical picnic at Vermillion, leaves 8:00 a. m.; Saturday, July 31, Americus club picnic at Oak Point, leaves 8:00 a. m.; Sunday, August 1, Cleveland to Oak Point, leaves Broadway 8:30 a. m.; also Cleveland to West Dover, leaves Pearl street 8:30 a. m. All Oak Point and Vermillion excursions stop at Lorain for passengers.

England's Merchant Marine.

In his effort to secure the passage of an act of congress levying a fixed special duty on all goods brought into the United States in vessels other than those of our own country, Senator Elkins has given a great deal of attention to the shipping question and to the various elements that combine to perpetuate England's mercantile power on the seas. Summing up these elements in a recent speech in the Senate, he said:

"First comes England's enormous tonnage, which far exceeds that of all other nations together. This is supported by the British Lloyd system of surveys and classifications, discriminating in favor of British-built vessels. That system, in turn, leads to discriminations by the insurance underwriters, favoring English ships. Then come mail subsidies, amounting to about \$4,000,000 a year, on which Great Britain is willing to suffer a seeming loss of about \$2,500,000 annually; while subsidies to steamships as auxiliary cruisers add about \$250,000 a year. Again, she mans her ships more cheaply than we man ours, employing fewer men to the ship and giving lower wages. Her ships are surer of cargoes, having markets everywhere. While the tax rate and insurance are low, the income from ship ownership is high, compared with the current rates of interest on money. The ship's supplies are taken from goods in bond, or duty free. In repairs, the ships have an unequaled dock equipment, with low rents for the docks and a low cost of labor.

"Other advantages which Great Britain holds are those of national pride an interest in marine affairs, giving the government a free hand in shipping matters; the possession of the beaten track of commerce and an enormous foreign trade covering the world; a banking system greatly accommodating the debtor nations, and tremendous in the capital and surplus of its banking houses; an excellent consular system; a national board of trade which has full executive power; a very extensive system of submarine and other wires; a system of great colonies all over the world, creating and supplying markets; finally, a powerful navy for the protection of the merchant marine, if needed. The wage-earning power of the British merchant marine is put at \$75,000,000 annually, and the freight and passenger earning power at \$500,000,000, while all this gives remunerative employment for supplying coal, iron and steel, and profits in building and repairing ships.

"These points are not enumerated by way of discouragement, but merely as a rational explanation of existing British maritime supremacy. They are hard facts, and it was with a reliance on existing facts that the London Times recently declared, in reviewing the discussions of the proposed revival of American shipping, that 'the Union Jack is not likely to have anything to fear from the Stars and Stripes for a long time to come.' But the true lesson is that, with Great Britain thus strongly intrenched in the world's carrying trade, no ordinary measures will restore to us a fair share of it."

Customs duties hereafter are not to be collected on ordinary repairs to the hull, tackle or machinery of a Canadian vessel, when made in a foreign port. This exemption does not, however, apply to machinery from any country excepting the United Kingdom, if it be of a class or kind made in Canada.

It is said that New York and Chicago capitalists have organized to build a great inland harbor in the heart of the Calumet region, twelve miles south of Chicago. The private capital to be expended in the project will be about \$6,000,000. The harbor will be adapted to the deepest draught navigation.

Go to Mackinac Island, Mich., the island of cool breezes, via the coast line. The D. & C. new steel passenger steamers leave Toledo, Mondays and Saturdays, 10:30 a. m., and Tuesdays and Thursdays, 4:30 p. m. From Detroit, Mondays and Saturdays, 11:00 p. m., Wednesdays and Fridays, 9:30 a. m. Send 2 cents for illustrated pamphlet. Address A. A. Schantz, G. P. A., Detroit, Mich.

A special train, Niagara Falls excursion, leaves Cleveland Aug. 5 at 10 p. m. \$3.00 for the round trip. Reserve sleeping car space at 189 Superior street, 534 Pearl street, or depots. 242, Aug. 5

\$3.00 to Niagara Falls via. the Nickel Plate road, Aug. 5. Special train leaves Cleveland at 10:00 p. m. Sleepers. 243, Aug. 5.

A Great Pump.

The Calumet & Hecla Mining Co. has a pump named the Michigan, which is a truly marvelous piece of mechanism. It can deliver 2,500,000 gallons of water every hour in the twenty-four, without being crowded to its limit of capacity, and it will do the work with scarcely as much noise as is made by the operation of an old style sewing machine. Outside the doors of the great building which houses it, no sound is heard from within, and standing beside the monster upon the brink of the pit connected with the lake from which the water is taken, almost the only sound heard is the noise of the suction, as with every stroke more than 1,000 gallons are lifted. Briefly, it is a triple expansion pumping engine with a capacity of 60,000,000 gallons, standing nearly 50 feet in height and requiring 1,500 horse power for its operation. It has been proved by actual tests that the nominal capacity can be easily maintained for an indefinite time without injury or strain, and that pushed to its full capacity the pump could handle approximately 75,000,000 gallons in twenty-four consecutive hours. The duty of the pump is to furnish water for the great stamp mills of the Calumet & Hecla Co., which has twenty-two steam pumps in continuous operation, daily pulverizing 5,000 tons of conglomerate rock into sand so fine that it can be carried away by a stream of swiftly running water. The pump is housed in a special building near the shore of Torch Lake, and below the mills, and it forces a steady stream of water to the upper portions of the mill, where innumerable small jets play upon the great slime tables and jigs. Here the specific gravity of the fine particles of copper contained in the rock separate the mineral from worthless sand, and the size and force of the streams of water are so nicely regulated as to wash away the sand and yet carry away with it the minimum of copper.

What a Submarine Boat Can Do.

John P. Holland, famous as a designer of submarine vessels, says in an article contributed to Cassier's Magazine:

"When engaged in harbor defense duty the position of the submarine vessel will be outside the outer line of harbor defense—that is, beyond the range of the guns defending the entrance. While performing this duty it will lie awash—that is, with only the top of its turret over the surface of the water. On the approach of an enemy's vessel the smoke stack will be shipped and the aperture on top of the turret through which it passed will be quickly closed water-tight. She will then run in a direction to intercept the enemy's ship, still remaining in the awash condition until she comes near enough to be discovered by the lookouts on the ship, when she will go from the awash to the entirely submerged condition. The distance from the ship at which she must dive will depend on the weather. In rough weather she can come quite close without being observed. Having come within a distance that the operator estimates at 200 or 300 yards from the ship, the diving rudders are manipulated so as to cause the top of the turret to come for a few seconds above the surface of the water. During this short exposure of the turret—much too short to give the enemy a chance to find its distance and train a gun on it capable of inflicting any injury—the pilot ascertains the bearing of the enemy's ship, alters his course or makes another dive if necessary. If he finds that the submarine boat is within safe striking distance, say 100 yards, a Whitehead torpedo is discharged at the ship. A heavy explosion within six seconds after the torpedo is expelled will notify the operator that his attack has been successful, and he may then devote his attention to the next enemy's ship that may be within reach. When the boat is running on the surface of the water, with full steam power, and it becomes necessary to dive quickly, the pilot gives the order "Prepare to dive." The oil fuel is instantly shut off from the furnace, the valves are opened to admit water to the water ballast tanks, an electric engine draws down the smoke stack and air shaft into the superstructure, and moves a large massive sliding valve over the aperture on the turret through which the smoke stack passes. These operations will be completed in about thirty seconds, when the boat is in the awash condition and prepared to dive. In twenty seconds more it will be running horizontally at a depth of 20 feet below the surface of the water, and quite beyond the reach of the enemy's projectiles."

G. A. R. attention.—The Nickel Plate road sells tickets to Buffalo Aug. 21, 22 and 23. Return limit as late as Sept. 20. 234, Aug. 21

Speed and Cargo Records—Lake Freight Steamers.

Iron Ore—Coralia, Mutual Transportation Co. of Cleveland, 5,088 gross or 5,699 net tons, Gladstone to Ashtabula, draft of 16 feet 10 inches. From Lake Superior—Steamer Crescent City, A. B. Wolvin of Duluth, 4,954 gross or 5,548 net tons, Two Harbors to Cleveland; Polynesia, James Corrigan, Cleveland, 6,134 net tons iron ore, Duluth to Lake Erie, draft 16 feet and 16 feet 7 inches; Andrew Carnegie, Wilson Transit Co. 5,160 gross tons ore, Two Harbors to Conneaut.

Grain—Schooner Amazon, James Corrigan of Cleveland, 217,000 bushels of corn, equal to 6,076 net tons, Chicago to Buffalo, 16 feet 6 inches draft. From Lake Superior—Steamer Andrew Carnegie, Wilson Transit Co. of Cleveland, 171,000 bushels of oats, 51,000 bushels of wheat and 55,000 bushels of barley, equal to 5,586 net tons, Duluth to Buffalo, 16 feet 1½ inches draft; steamer Crescent City, A. B. Wolvin of Duluth, 318,000 bushels of oats, equal to 5,088 net tons, Duluth to Buffalo.

Coal—Schooner Aurania, John Corrigan of Cleveland, 5,187 net tons bituminous, Toledo to Milwaukee; steamer Andrew Carnegie, Wilson Transit Co. of Cleveland, 4,997 net tons of bituminous, Cleveland to Sheboygan, draft of 15 feet 2 inches.

Speed—Owego, Union Line of Buffalo, Buffalo to Chicago, 889 miles, 54 hours and 16 minutes, 16.4 miles an hour; Centurion, Hopkins Steamship Co. of St. Clair, Mich., Buffalo to Duluth, 997 miles, 65 hours and 10 minutes, 15.3 miles an hour; City of Buffalo, Cleveland to Put-in-Bay, 64 miles, 2 hours and 50 minutes, 22.58 miles per hour.

Eight dollars from Cleveland to Mackinac and return, \$7 from Toledo to Mackinac and return, \$6 from Detroit to Mackinac and return: The foregoing special tourist rates will be put into effect June 20th, via Detroit & Cleveland Steam Navigation Co.'s new mammoth steel passenger steamers. The round trip from Cleveland, including meals and berths, costs \$16, from Toledo \$14, from Detroit \$11.50. Send 2 cents for illustrated pamphlet. Address A. A. Schantz, G. P. A., Detroit Mich.

A special \$3 excursion to Niagara Falls via the Nickel Plate road, Aug. 5. Train leaves Cleveland 10 p. m. For sleeping car berths apply at 189 Superior street, 534 Pearl street and depots. 245, Aug. 5.

OFFICE OF LIGHT-HOUSE ENGINEER, 9th and 11th Districts Detroit, Mich., July 24, 1897. Sealed proposals will be received at this office until 3 o'clock P. M. of Monday, the 16th day of August, 1897, for Sturgeon Bay Canal and Devils Island Light Towers, Wisconsin, and North Manitou Light Tower, Michigan. Plans, specifications, forms of proposals and other information may be obtained on application to this office. The right is reserved to reject any or all bids, and to waive any defects. M. B. ADAMS, Major, Corps of Engineers, U. S. A., Light-House Engineer. Aug. 4

U. S. ENGINEER OFFICE, Duluth, Minn., July 10, 1897.—Sealed proposals for building two breakwater piers, each some 2700 feet long, at Lake Superior entrance to Portage Lake Ship Canals, Mich., will be received here until noon, Sept. 10, 1897, and then publicly opened. Information furnished on application. CLINTON B. SEARS, Major Engrs. Sept. 3.

The Bessemer Steamship Company

Solicits Catalogues, Prices and Discounts from manufacturers and wholesale dealers in Ship Machinery, Brass Goods, Rope, Paints, Asbestos, Packing, Hose, Furniture, Piping, Glass and Crockery, Tinware, Ranges, Carpeting, Bedding, Life-preservers, Rafts and Boats, Engineers' Supplies and Tools, Carpenters' Tools, Electric Supplies, Lamps, Grate Bars, Castings, etc., etc., etc.

ALSO QUOTATIONS from Market men and Grocers on the Lakes for Provisions and Meat, best quality only.

CATALOGUES without quotations are not wanted.

ALL GOODS except provisions to be delivered in Cleveland.

Address L. M. BOWERS, General Manager,
CLEVELAND, OHIO.

FOR SALE.

Marine Engine Patterns. Modern type with working drawings. 3x5 simple, 5x7 simple, 8-18x12 compound, 10-20x12 compound, 4½-7-11x8 triple expansion, 6-10-16x10 triple expansion, 10-16-25x15 triple expansion. Can be had at a bargain. Would like an offer for them.

C. C. WORMER MACHINERY CO.,
55-59 Woodbridge St., W., Detroit, Mich.

Total Losses During Several Years Past.

[From Blue Book of American Shipping.]

Insurance companies doing business on the lakes encounter heavy losses from strandings in connecting rivers and from steel vessels coming in contact with new shoals that are encountered mainly on account of the deepening of channels which has been going on for several years. Losses from collision are also quite heavy in both steel and wooden vessels, but in most cases the sunken vessels are not in deep water, and they are readily raised and repaired. It is unfortunate that figures covering losses of this kind, which are very large, cannot be secured, on account of a refusal on the part of underwriters engaged in lake business to act collectively in preparing information of this kind. The following table gives number, capacity and value of lake vessels that have actually passed out of existence during the past six years. Only such vessels as were total losses in the real sense of the word are included in this table. The statistics do not, therefore, cover, by any means, the entire loss to shipping in the years named, as they do not include partial losses of the kind referred to above.

	Number of Vessels.	Capacity.	Value.
1896	35	21,425	\$ 386,500
1895	63	48,975	1,290,100
1894	54	31,415	522,750
1893	65	41,625	1,172,200
1892	57	28,708	1,014,250
1891	52	27,496	564,800
1890	34	16,306	757,000

Chas. E. & W. F. Peck,

58 William St.
NEW YORK CITY.

812 Royal Insurance Building,
CHICAGO, ILL.

C. T. BOWRING & CO.,
5 & 6 Billiter Ave., E.C.
LONDON, ENG.

INSURANCE.

BROWN & CO.,
202 Main St.,
Buffalo, N. Y.

J. G. KEITH & CO.,
138 Rialto Bldg.,
Chicago, Ill.

LA SALLE & CO.,
Board of Trade Bldg.,
Duluth, Minn.

Are prepared to make rates on all classes of Marine Insurance on the great lakes, both CARGOES and HULLS.

"GREAT LAKES REGISTER."

F. D. HERRIMAN, Surveyor-General, Chicago, Ill.

FOR SALE—

CRUISING YACHT, 42 feet long, worth \$2,000.
Will be sold cheap for cash. For information inquire

853 Stark St., Cleveland, O.

DIVING APPARATUS WANTED:

Parties with diving apparatus in good condition for sale can find a purchaser by addressing

Dunbar & Sullivan,
1009 D. S. Morgan Building,

Buffalo, N. Y.

Newport News Shipbuilding & Dry Dock COMPANY.**WORKS AT NEWPORT NEWS, VA.**
(On Hampton Roads.)

Equipped with a Simpson's Basin Dry Dock capable of docking a vessel 600 feet long, drawing 25 feet of water, at any stage of the tide. Repairs made promptly and at reasonable rates.

SHIP AND ENGINE BUILDERS.

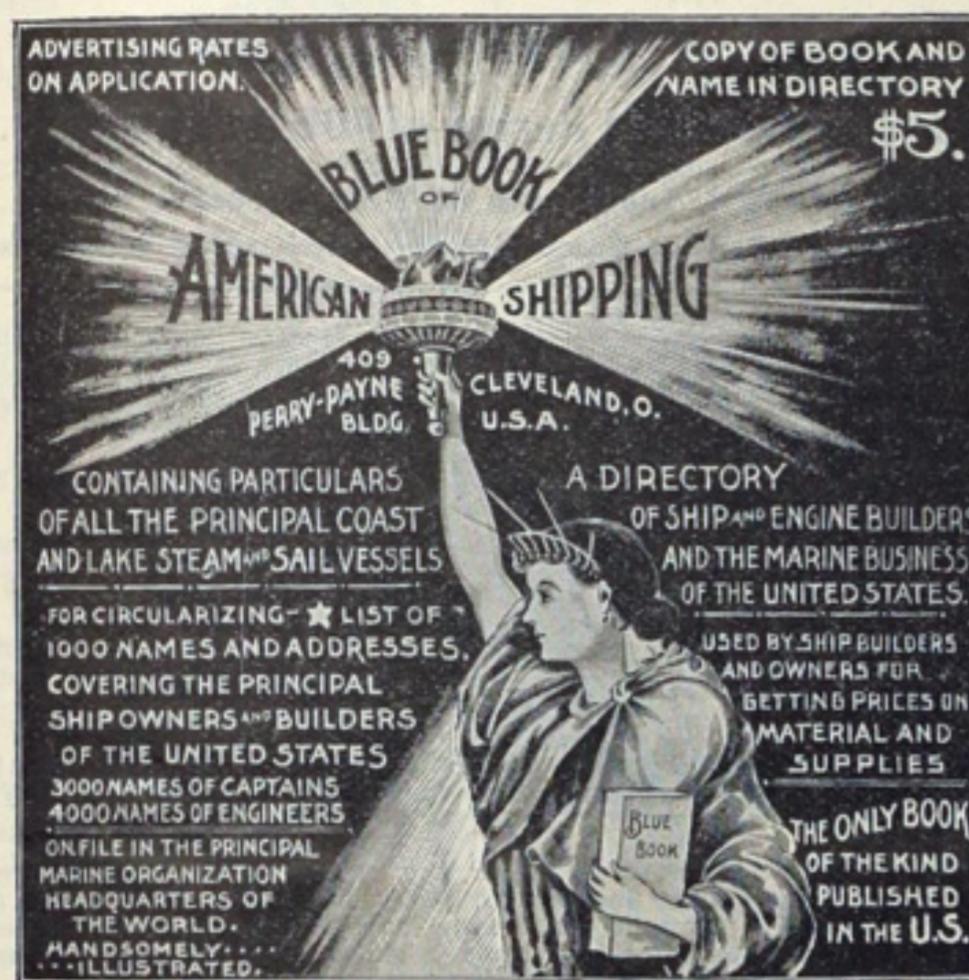
For estimates and further particulars, address

C. B. ORCUTT, Pres't,
No. 1 Broadway, New York.

WANTED

Party to furnish material for a steel hull from 55 to 60 feet long by 12 feet beam, and go in partnership with party who owns a suitable engine for same.

CEO. WOLF,
132 West River St., City.

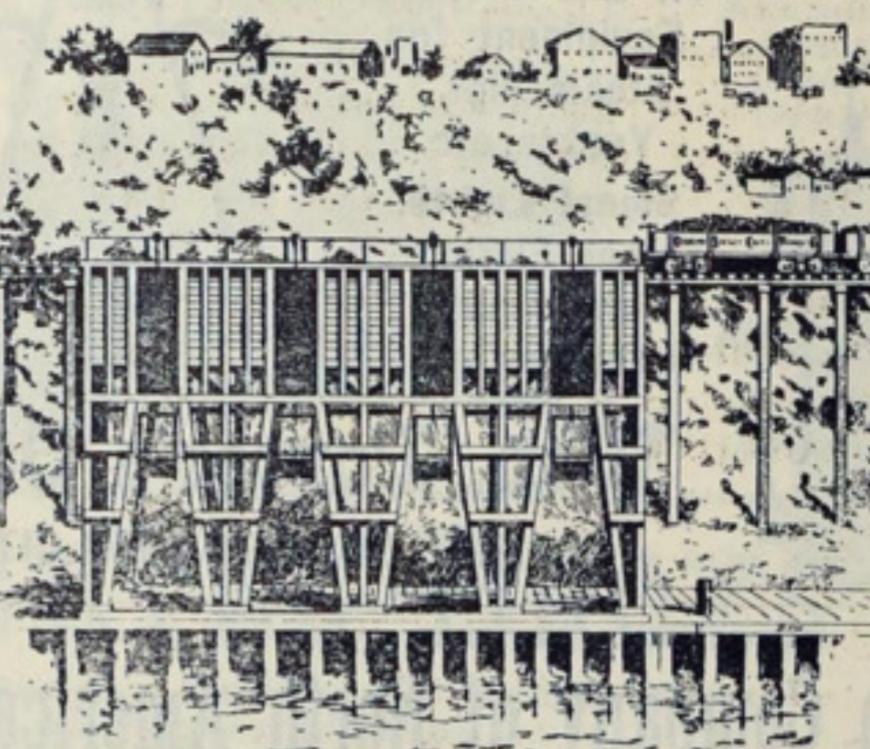


PUBLISHED JULY 15.

Now ready for delivery to Purchasers.

FUEL DOCKS OF OSBORNE, SAEGER & CO.

Cuyahoga River, just above Superior St. Viaduct, Cleveland, O

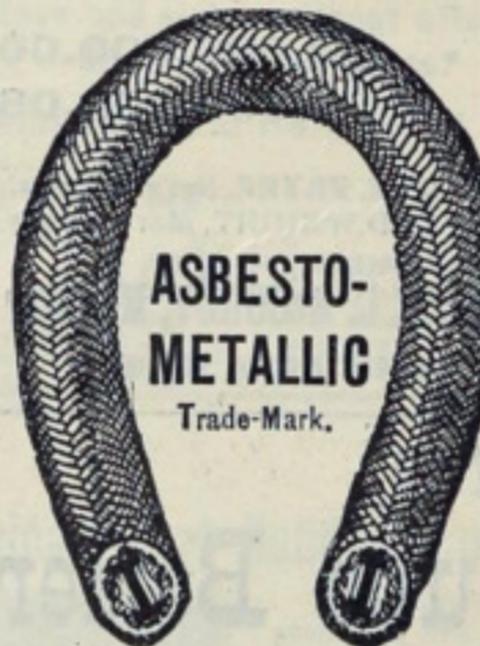


Best
Youghiogheny
Steam Coal
Furnished
Day or Night.
No delay as
Elevated
Pockets
are used.
Telephone 1106.

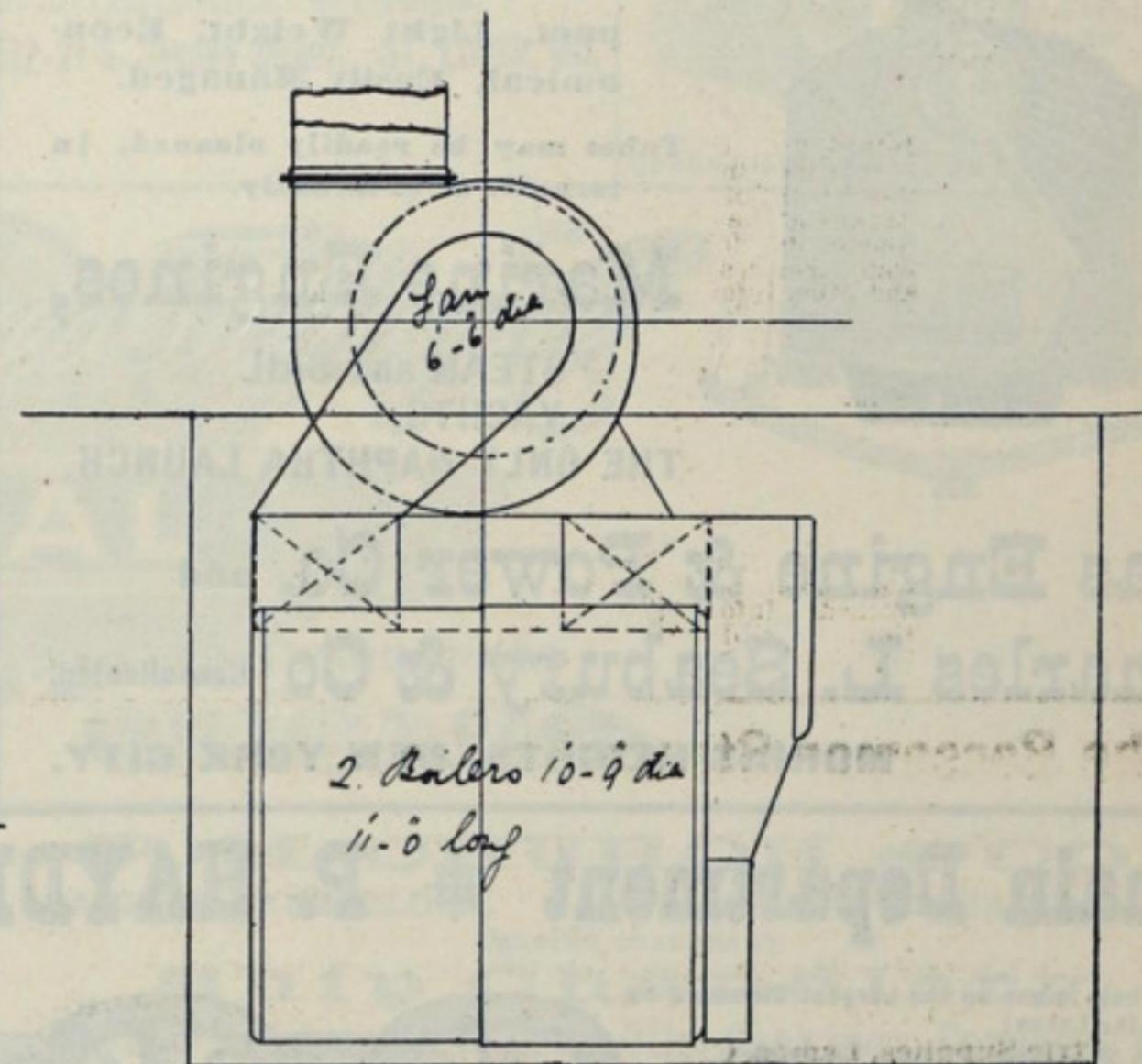
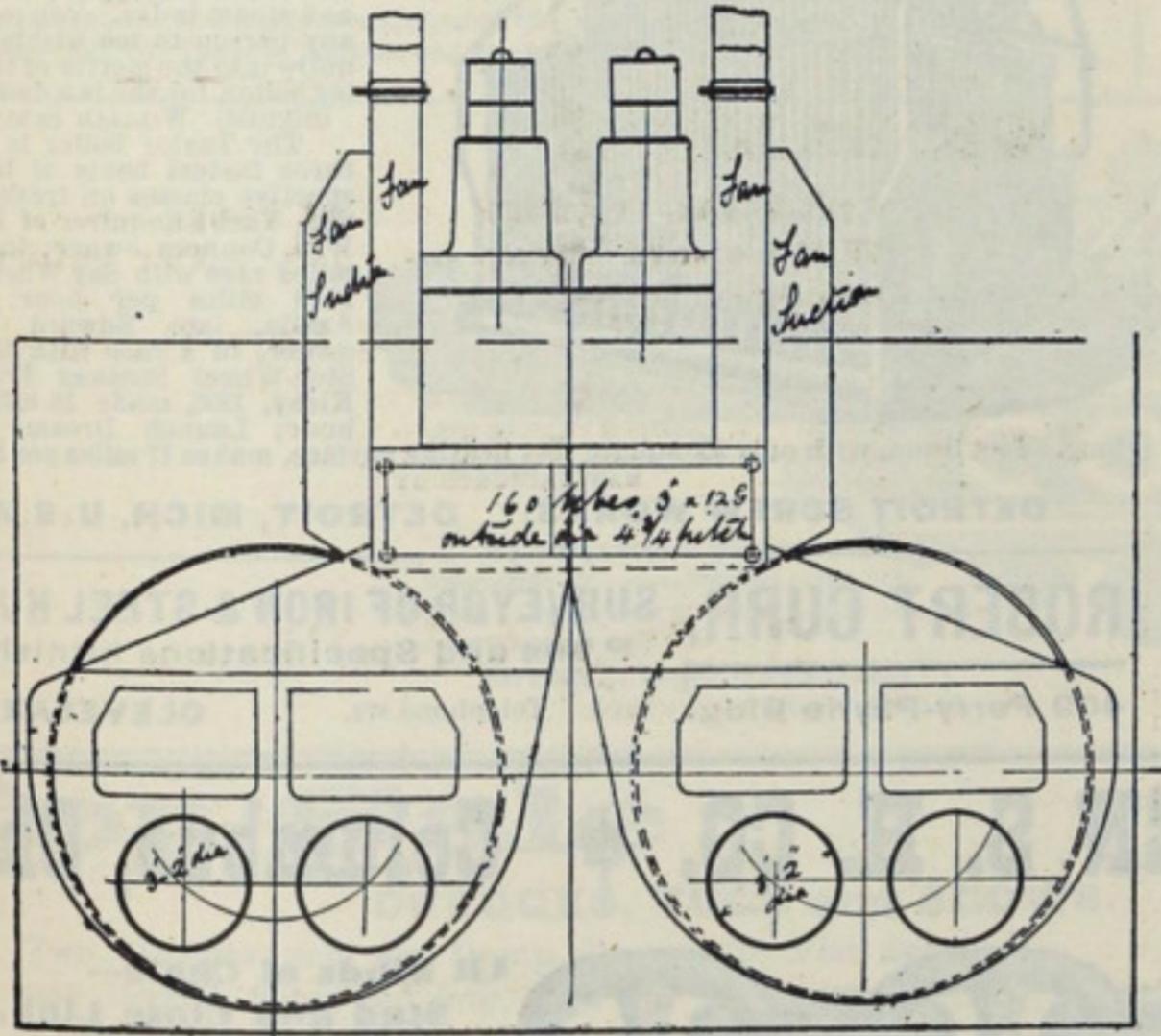
Lucky is the Engineer
Who Uses

ASBESTO-METALLIC PACKING

It is in use on more lake steamers than any other, because it meets the requirements.



AMERICAN STEAM PACKING CO.,
Original Manufacturers of
PISTON PACKINGS,
60 Federal St., BOSTON, MASS.

The Ellis & Eaves Induced Draft--Serve Ribbed Tubes

DRAWING SHOWING PLAN FOR ADDING THE ELLIS & EAVES DRAFT TO LAKE STEAMERS.

THIS SYSTEM OF DRAFT, WITH THE SERVE TUBES, SAVES MONEY.

S A V E S 25 Per Cent. of Your Fuel Bills.

A \$ \$ \$ A 40 to 50 Per Cent. Boiler Capacity.

V \$ \$ \$ V The Life of the Boiler by Drawing Gases through Tubes.

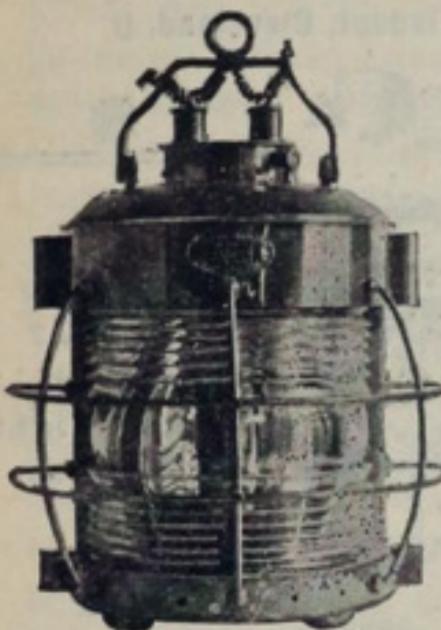
E \$ \$ \$ E Firemen and Incidentally their Wages.

S A V E S Cargo Space by Using a Smaller Number of Boilers.

For PARTICULARS and PRICES of applying to Steamers already Built and to Steamers Building, apply to
THE GLOBE IRON WORKS COMPANY,

CLEVELAND, OHIO.

MARINE LAMPS



Oil and Electric
Equipment for
Steamships,
Yachts, etc.
Signal Lights,
Saloon Fixtures,
Cabin Lamps,
Lanterns, etc.



Wm. Porter's Sons,
271 Pearl St., NEW YORK CITY.

INCORPORATED 1794.

Insurance Company of North America

CAPITAL, Paid up in Cash, - - -	\$3,000,000.00
ASSETS,	9,686,808.08

CHARLES PLATT, President.
EUGENE L. ELLISON, Vice-President.

GREVILLE E. FRYER, Sec'y. & Treas.
T. HOWARD WRIGHT, Marine Sec'y.

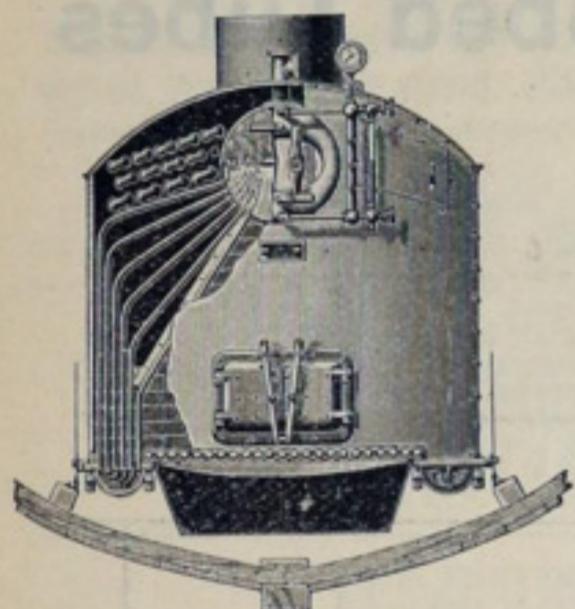
JOHN H. ATWOOD, Assistant Secretary.

GEORGE L. McCURDY, Manager
CHICAGO, ILLS.

Lake Marine Department.

SEABURY'S Safety Water Tube Boiler

For all types of Steam Vessels and
Stationary Plants.



Reliable, Safe, Durable, Compact, Light Weight, Economical, Easily Managed.

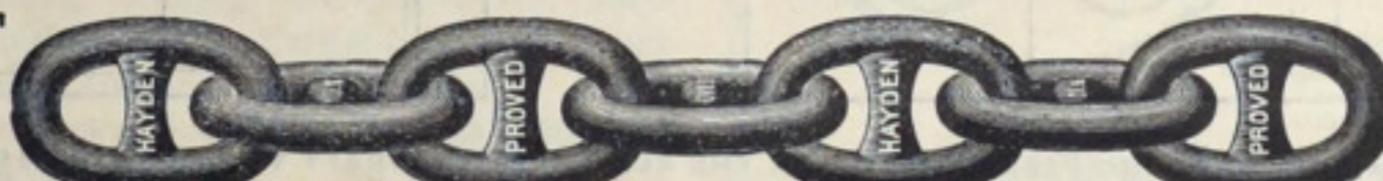
Tubes may be readily cleaned, internally or externally.

Marine Engines,
STEAM and SAIL
YACHTS,
THE ONLY NAPHTHA LAUNCH.

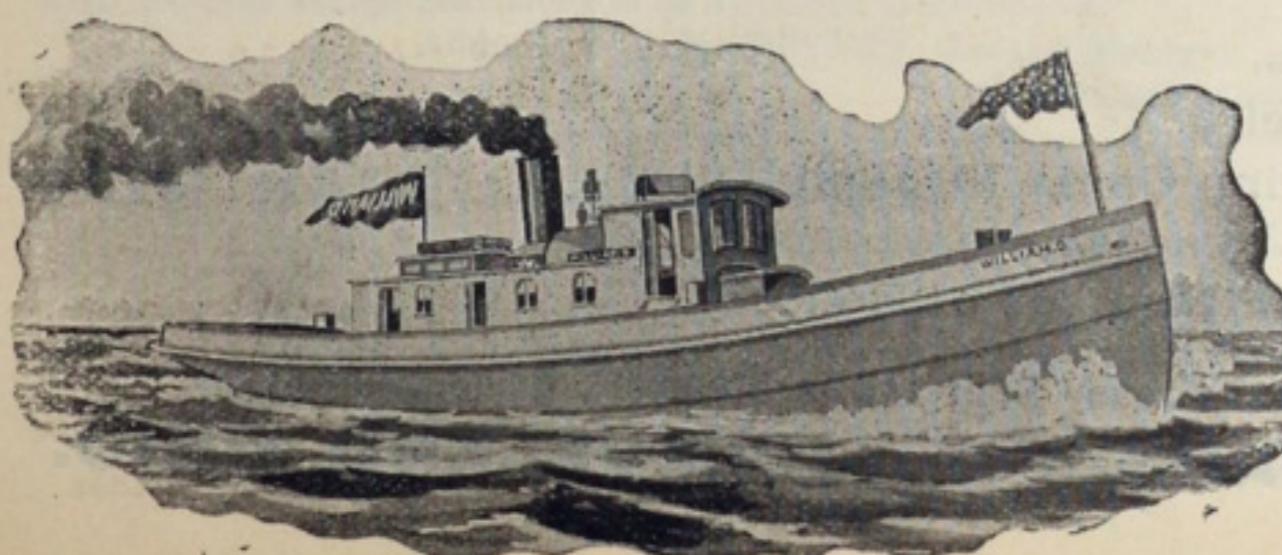
**Gas Engine & Power Co. and
Charles L. Seabury & Co.** Consolidated.
MORRIS HEIGHTS, NEW YORK CITY.

Chain Department * P. HAYDEN S. H. CO. * Columbus, Ohio.

Our Chain in use on the Largest Steamers on
the Lakes:
The Zenith City, Victory,
North West and North Land,
and many others.



All kinds of Chain—
Stud and Close Link,
Cable Chains.
Write for Prices.



G. H. FOSTER, Prest. MARK H. HANLON, V.-Prest. & Secy. W. H. WARNER, Treas.
DAVID BARNHISEL, Gen'l Mgr.

The Inter-Ocean Coal & Coke Co.

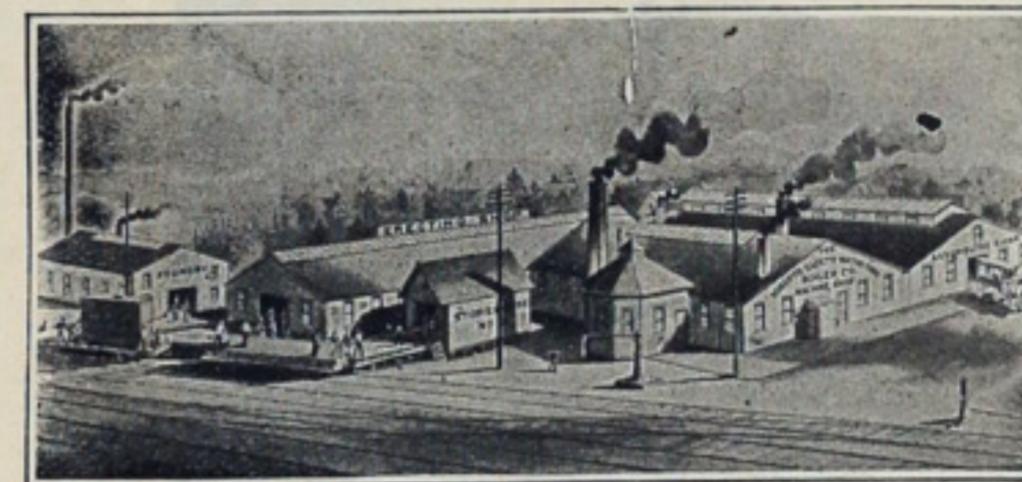
General office, 513 Perry-Payne Bldg., Cleveland.

PRODUCERS AND SHIPPERS.

Choicest Grades of YIOUGHIOGHENY COAL FOR STEAMBOAT FUEL.

Lighter in Cleveland Harbor of 400 tons capacity.

CLEVELAND DOCKS, just north of Main Street bridge.
SAULT RIVER DOCK at Sault Ste Marie. $\frac{1}{4}$ mile below the locks.



Office of
AMERICAN
STEEL BARGE
CO.

West Superior
Wis.,
Oct. 31, 1895.

The Roberts
Safety Water
Tube Boiler Co.,
39 and 41 Cortlandt
St., New York.

Gentlemen:
Relying to
yours of the
28th I am glad
to say that the boiler you furnished us for tug "ISLAY" is giving entire satisfaction. I have heard no complaint about it whatever, but have heard a good deal in its favor. Very Truly yours,

Alexander McDougall, General Manager.

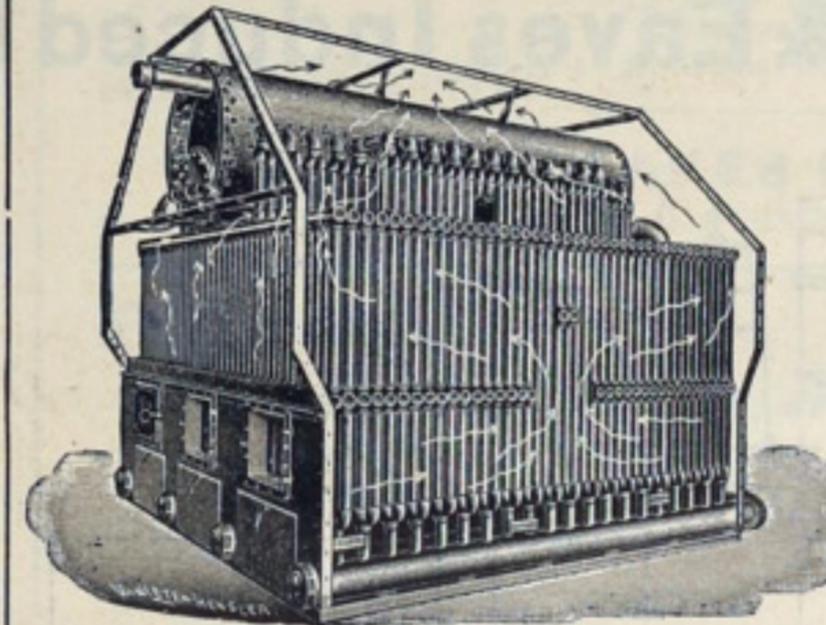
THE ROBERTS BOILER is the Cheapest, Best and Lasts Longest

Adapted for use in Yachts, Launches, and Vessels of all Kinds.

Handsome Illustrated Circular sent free on application to

The Roberts Safety Water Tube Boiler Co.,
WORKS, RED BANK, N.J. 39 & 41 Cortlandt St., NEW YORK.

TAYLOR PATENT UPRIGHT WATER TUBE BOILER.



Chief Engineer Skelton of
Steam Yacht Enquirer writes:
"I can honestly say, that the Taylor
boiler is the best boiler I ever
handled, and I have been in the
business 18 years. It is light
on fuel, carries steady water line
and steam is dry. You can refer
any person to me wishing to inquire
into the merits of the Taylor
boiler, for she is a dandy."

(Signed) WILLIAM SKELTON, Jr.

The Taylor boiler is in the
three fastest boats of their re-
spective classes on fresh water,
viz., Yacht Enquirer of Buffalo,
W. J. Connors owner; in a 29 $\frac{1}{2}$
miles race with Say When made
18.78 miles per hour; Yacht
Azalia, late Edward Henkel
owner, in a race with the fast
Side-Wheel Steamer Frank E.
Kirby, 1896, made 18 miles per
hour; Launch Dream, 63 feet
long, 9 feet beam, with only 350 square feet heating surface, makes 17 miles per hour.

MANUFACTURED BY
DETROIT SCREW WORKS, DETROIT, MICH. U.S.A.

ROBERT CURR, SURVEYOR OF IRON & STEEL HULLS,
Plans and Specifications furnished.

409 Perry-Payne Bldg.

Telephone 472.

CLEVELAND, O.

C. E. GROVER, Prest.
D. R. HANNA, V. Prest.

W. A. COLLIER, Sec. & Treas.
CAPT. PHILIP SHIED, Marine Supt

The Ashtabula Tug Co.

Incorporated.
W. A. COLLIER, Gen. Mgr.

CLEVELAND, Tel. 409.

ASHTABULA, Tel. 149.

MAIN ST. BRIDGE,
CLEVELAND, O.

CHICAGO.
BARRY BROS.
Independent Tug Line.

TUGS

Rita McDonald, Wm. Dickinson,
Crawford, W. H. Wolf,
C. M. Charnley, Welcome,
D. P. Hall, Commodore,
Ira O. Smith, Jack Barry.
Office, 240 South Water Street,
Telephone Main 273.

3 long whistles call our tugs.

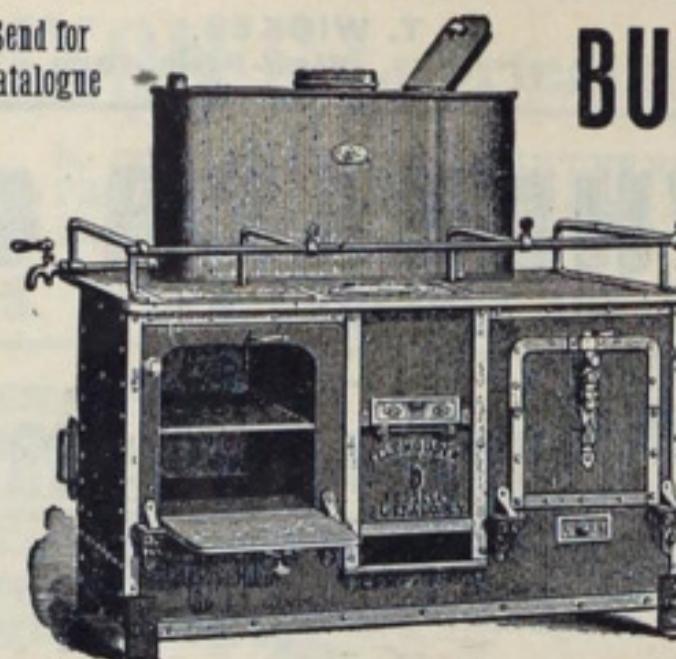
DULUTH.
BARRY
Towing & Wrecking Co.

TUGS.

G. A. Tomlinson.
Industry,
Violet H. Raber,
Prodigy.
Office, foot of 5th Ave., West.
Telephone 544.

3 long whistles call our tugs.

Send for
Catalogue



BUFFALO WROUGHT STEEL RANGES

Steamboat and Vessel
Ranges and Boilers,
with patent Rotary
Grate.

SOMETHING NEW AND GOOD.
We also carry the STAMFORD TUG
AND YACHT GALLEY STOVES.

RUSSELL & WATSON

Successors to Felthousen & Russell.
145 Main St., BUFFALO, N.Y.

PINTSCH GAS LIGHTED BUOYS

Adopted by the English, German, French, Russian, Italian, and United States
Light House Departments, for Channel and Harbor Lighting; over
500 gas buoys and gas beacons in service.

BURN CONTINUOUSLY

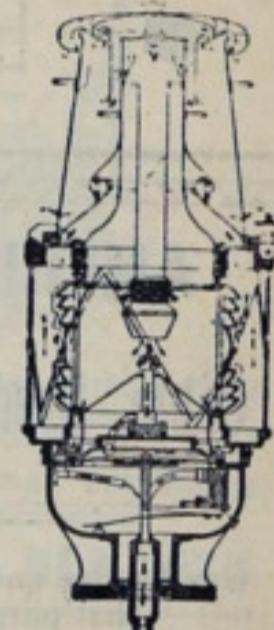
from 80 to 365 days and nights without attention, and can be seen a
distance of six miles.

Brilliant and Steady Illumination. Economical and Reliable in Operation.

CONTROLLED BY THE

Safety Car Heating & Lighting Company,

160 BROADWAY, NEW YORK CITY.



WANTED

To lease, purchase or secure, a passenger boat to make an excursion run for whole season. Must be a good boat, well fitted for that purpose, not over 200 feet keel and must not draw more than seven feet water loaded, and five feet would be better. Should be able to develop speed of twelve miles per hour.

Address MARINE REVIEW, Cleveland, O.

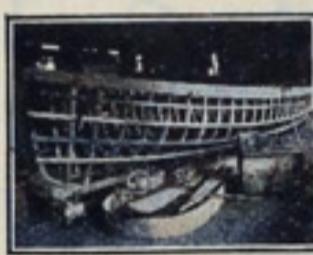
JOHN HAUG, Consulting Engineer and Naval Architect.

Ship and Engineer Surveyor Lloyds Register, London.
Plans, Specifications and Superintendence of Ships and their Machinery. Place,
specialties—Bulk Oil Vessels High Speed Yacht Engines, etc.

206 Walnut
Philadelphia.

American Boat Building Co.

Incorporated.

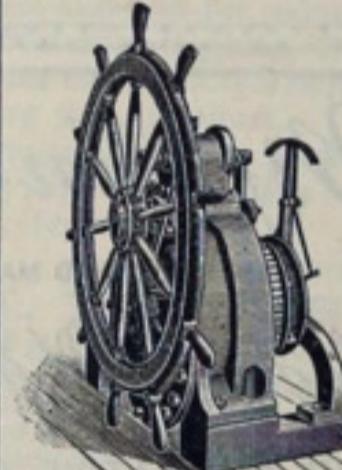


35x7 foot Launch Frame.

3517-21 S. Second Street, ST. LOUIS, MO.

Queen City Hydraulic Steerer.

Best and
Most Powerful
Steerer



FOR TUGS,
STEAMERS,
ETC.

Price—From
\$650 to \$750, ac-
cording to size
and location in
steamer.

Manufactured
by

QUEEN CITY ENGINEERING CO. Buffalo, N.Y.

O. J. Pilkerson Fueling Co.

FUELING DOCKS:
NORTH PIER
18½ STREET BRIDGE,
ILLINOIS CENTRAL SLIP C.

STORAGE DOCKS FOR ANTHRACITE:
KINGSBURY ST. BETWEEN INDIANA & ERIE STS.
ELSTON AVE. DIVISION ST. BRIDGE (NORTH BRANCH)
NORTH AVE. BRIDGE.
DIVISION ST. BRIDGE (OGDEN CANAL)
SOUTH HALSTED ST. BRIDGE.

COAL

OFFICE,
225 DEARBORN ST.

CHICAGO.

For Sale:

DREDGES, TUGS and SCOWS.

Two Dredges and six Dump Scows, one Flat Scow,
one Derrick Scow and four Tugs—

One with 15 by 17 engine, allowed 110 lbs. steam.
" " 17 by 16 " " 110 " "
" " 20 by 22 " " 125 " "
" " 20 by 24 " " 110 " "

Inquiries from parties who mean business cheerfully
answered.

JAMES ROONEY, 1118 Collingwood Av., Toledo, O.



ALKALI WATER PURIFIER!

A Pure Chemical for the safe Removal and Prevention of Scale in Steam Boilers. In use by many of the larger steamship lines on the great Lakes. Guaranteed.

MANUFACTURED BY
THE J. H. PARSONS CHEMICAL CO.,
1509 Masonic Temple, CHICAGO, ILL.

P. M. CHURCH & CO., SAULT STE. MARIE, MICH

LEADING DEALERS IN

Ship Chandlery,

Marine Hardware, Paints, Oils, Packings, Cordage, Etc.

FIRST-CLASS COPPERSMITH AND TINSHOP IN CONNECTION

The Chase Machine Co.

111 Elm St., Cleveland, O.

MACHINISTS and ENGINEERS

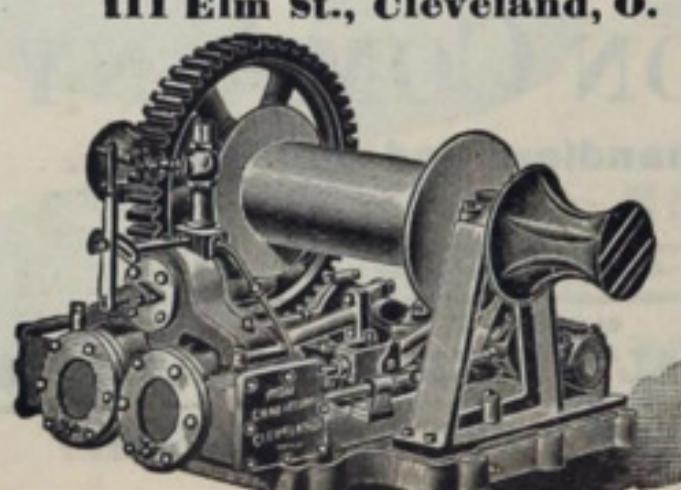
MANUFACTURERS OF
Land and Marine Engines
and Steam Pumps.

SOLE OWNERS AND MANUFACTURERS OF
Chase Fog Whistle Machine.
Over 150 in use on the best class
of Lake Steamers.

Special Attention given to

MARINE REPAIR WORK.

Engineers' Supplies,
Asbestos Pipe and Boiler Covering.
TELEPHONE 994.



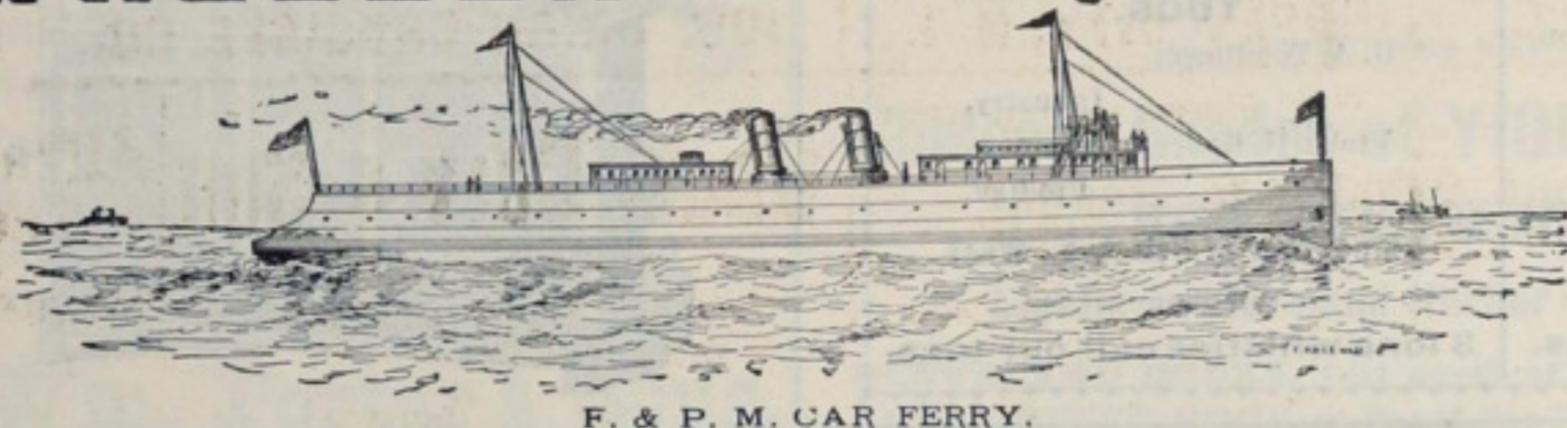
F. W. WHEELER,
President.

H. T. WICKES,
Vice-President

C. W. STIVER,
Secretary.

JNO. S. PORTER,
Treasurer.

F. W. WHEELER & CO., West Bay City, Mich.



F. & P. M. CAR FERRY.

Builders of all kinds of METAL AND WOODEN SHIPS.

AMERICAN CHAIN CABLE WORKS.

ESTABLISHED 1865.

Cable, Dredge, Quarry, Shipping, Crane and Rafting
CHAINS.

Our Dredge and Crane Chains are made of Iron Rolled Specially for
that purpose in three qualities, "Burden's," "H. B. & S."
iron, and "Burden's Best Best" iron.

THE J. B. CARR COMPANY, TROY, NEW YORK.

The Martin-Barris Co.

IMPORTERS AND MANUFACTURERS OF

Mahogany, White Mahogany,

AND ALL NATIVE CABINET WOODS.

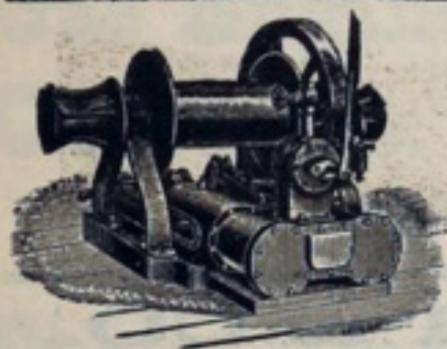
HIGH GRADES OF KILN DRIED WOODS FOR
CABIN WORK AND INSIDE TRIM.

White Oak Timbers and Plank

CONSTANTLY ON HAND AND SAWED TO ORDER
ON SHORT NOTICE.

654 Seneca Street,

Cleveland, Ohio.



DOCK and DECK HOISTS
ALL KINDS OF
Machinery & Friction Hoists.

SEND FOR PRICES AND CIRCULARS.

JACKSON & CHURCH,
SAGINAW, MICH.

HOWARD H. BAKER & Co.

Ship Chandlers and Sail Makers,

18 to 26 Terrace.

BUFFALO, N.Y.

H. CHANNON COMPANY

Ship Chandlers and Sail Makers.

AGENTS FOR

RYLANDS BROS.

MANUFACTURERS OF

ENGLISH GALVANIZED STEEL HAWSERS,

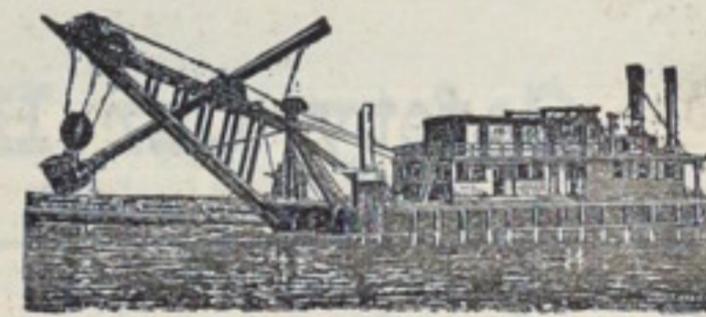
24-26 Market Street, CHICAGO, ILL



THE L. P. & J. A. SMITH CO.,

Contractors of Public Works.

Dredging,
Pile-Driving,
Breakwaters,
Dry Docks and
Pier Building,



Railroads,
Canals,
Bridges,
Foundations,
Etc., etc.

23 River St.,

CLEVELAND, O.

H. E. STEVENS.

TOM MEAD.

LEW PRESLEY

BUCKEYE STEAM FITTING CO.

Steam Fitters, Engineers Supplies,

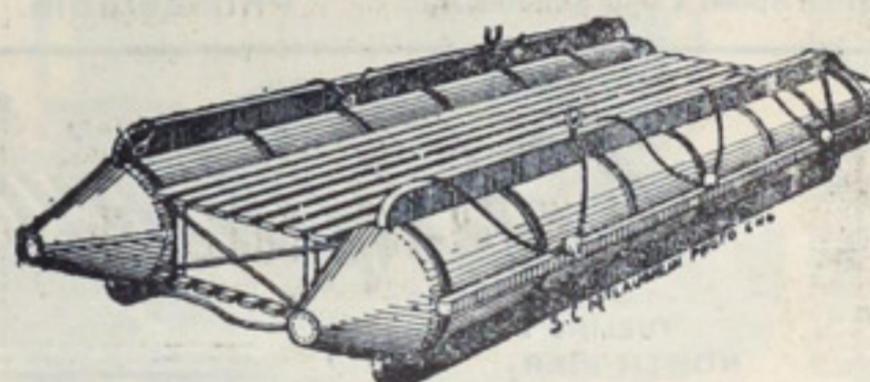
Phone 4058.

AGENTS FOR

RAINBOW PACKING.

Open Day and Night.

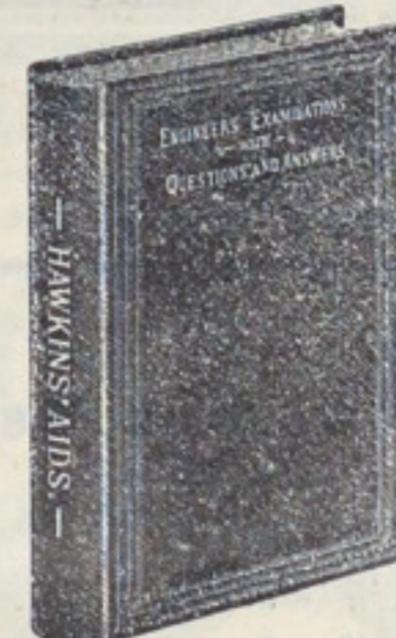
117 River St., CLEVELAND, O.



Thos. Drein & Son,

BUILDERS OF

Metallic Life Boats and Rafts,
Government and Pleasure
Boats. Block and Granulated
Cork Life Preservers. Outfit
for Lake Steamers a Specialty.
TATNALL & RAILROAD STS.
Wilmington, Del.



"Engineers' Examinations"

With Questions and Answers.



Printed on heavy paper and bound in
red leather.

Anv young engineer, greaser or fire-
man ought to have it.

Sent postpaid to any address, on receipt
of \$2.00.

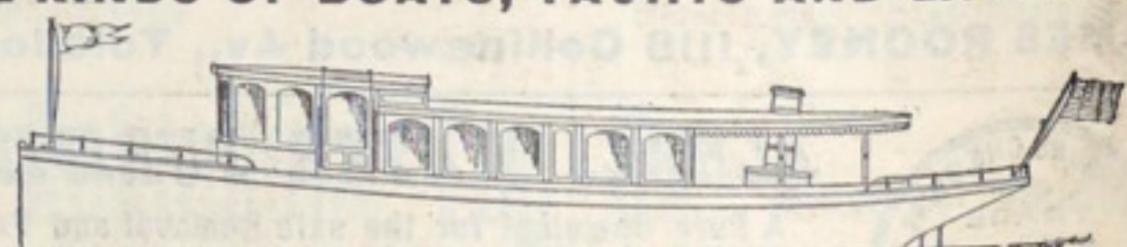
MARINE REVIEW,

410 Perry-Payne Bldg.
Cleveland, O.

"Maxims and Instructions for the Boiler Room," \$2.50

"Hand-Book of Calculations for Engineers," ... 2.50

ALL KINDS OF BOATS, YACHTS AND LAUNCHES



Frames set up, MARKED AND SHIPPED KNOCKDOWN to any part of the world.
Send 50 cents for "ALBUM OF DESIGNS"; 72 Pages, 43 Subjects, 66 Designs.

Address Station A.

FRED W. MARTIN, Yacht Designer,
NORTH CHICAGO ILL. (Formerly of Racine, Wis.)

DIXON'S Graphite Pipe Joint Compound

Enables you to MAKE A TIGHTER JOINT than you can possibly make with red lead. You can do it easier, and parts can be separated at any time without breaking anything. Send for sample and circular.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

Fred'k Baldt, President.

W. M. Gelston, Vice-President

W. S. Bickley, Sec'y and Treas.

Baldt Patent Stockless Anchor.

Made of the finest quality of open-hearth steel and constructed on the ball and socket principle.

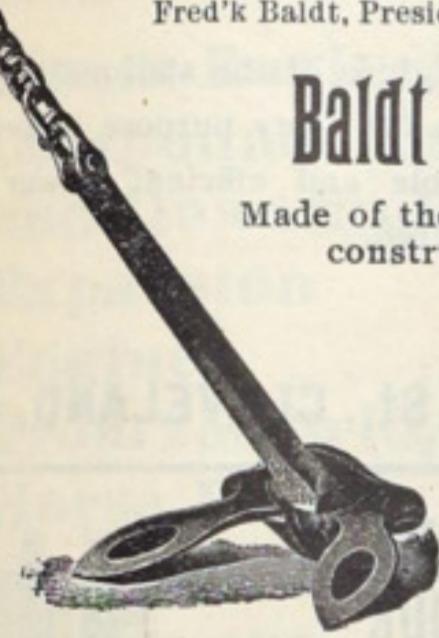
Many points of superiority over ordinary Stockless Anchors.

**BALDT ANCHOR COMPANY,
CHESTER, PA.**

WALTER MILLER, Western Reserve Bldg.,
Cleveland, Ohio,

Representative for the Great Lakes.

New catalogue containing valuable tables sent
on application.

**Bement, Miles & Company,
PHILADELPHIA, PA.**

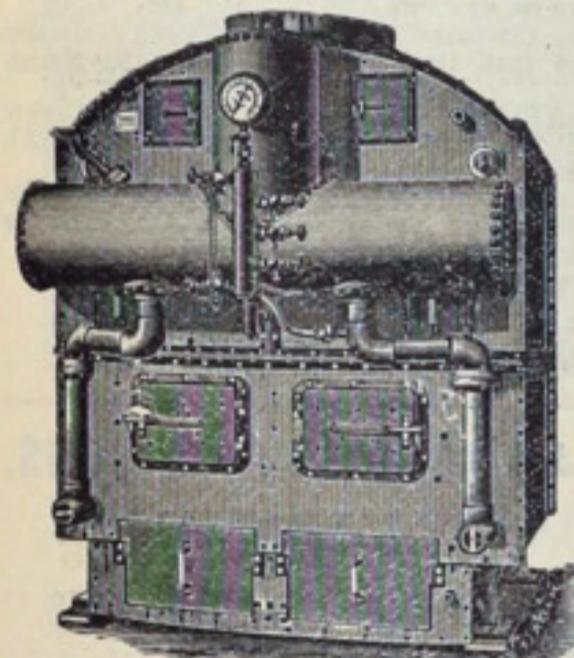
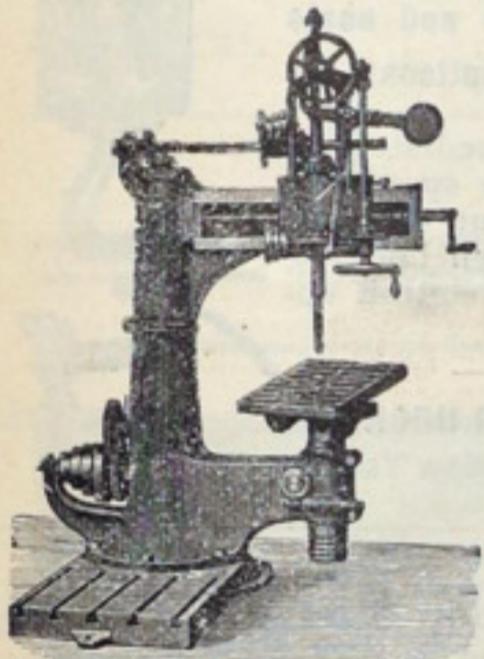
MANUFACTURERS OF

Metal Working Machine Tools

For Ship Yards, Railroad Shops, Locomotive and Car Builders, Machine Shops, Rolling Mills, Steam Forges, Boiler Shops, Bridge Works, etc., etc.

Steam Hammers, Steam and Hydraulic Riveting Machines.

New York Office: Taylor Bldg. No. 39 Cortlandt St.
Chicago Office: 1534 Marquette Building.

**ALMY'S PATENT
SECTIONAL
Water-Tube Boilers.**

NOW USED IN

18 Passenger Boats from 70 to 160 feet long.
27 Steam Yachts from 50 to 160 feet long.
U. S. Torpedo Boat "Stiletto."

Numerous Small Launches and Stationary Boilers are giving most excellent results.

ALMY WATER-TUBE BOILER CO.,

No. 178-184 Allens Avenue,
near Rhodes St.

PROVIDENCE, R. I.

VANDUZEN Steam Jet Pumps

THE BEST IN THE WORLD.
Pumps any kind of Liquid. Always in order.
Never clogs nor freezes. Fully Guaranteed.
COST \$7 AND UPWARD. Especially useful for
Mines, Quarries, Pits, Wells, Clay Pits, Breweries,
Steamships, Ferryboats, Sugar Plantations, etc.
A full stock always on hand.

Descriptive Catalogue and Prices furnished Free. THE E. W. VAN DUZEN CO., CINCINNATI, O.



SIMPLE,
STRONG
and
RELIABLE.

Changed
from Steam
to
Hand by one
Lever in
Less Than
One Second



No. 8
BECK
Patent
Steam
and Hand
STEERING
GEAR.

BUILT BY
Pawling &
Harnischfeger,
MILWAUKEE,
WIS.

DIXON'S Lubricating Graphite

Is fully explained in an INTERESTING AND INSTRUCTIVE PAMPHLET which is FREE to all interested. It will pay all Engineers and Machinists to SEND FOR IT.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

Chas. Cory & Son

Manufacturers of the
Mechanical and Electric
Marine Telegraph,



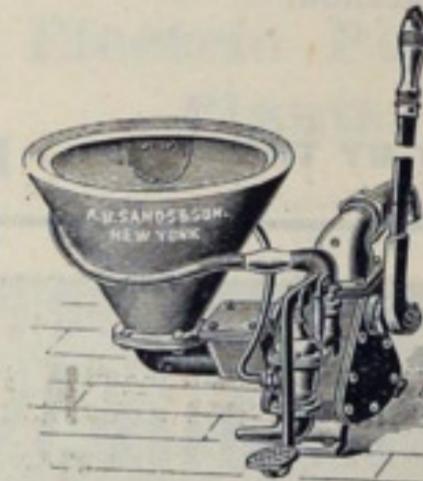
Electrical
Helm Indicators
Electric Call
Bells.

Engine Bells and
Brass Work of
all descriptions,
Shrieking and
Siren Whistles.

278 DIVISION ST.,
NEW YORK CITY.

**Alfred B. Sands & Son
YACHT PLUMBERS,
AND MANUFACTURERS OF
YACHT PLUMBING SPECIALTIES.**

Patent applied for.



The only pump water closet in the world so
constructed as to be positively free
from danger of flooding.

Folding Lavatories, Pumps Ventilators,
Etc., Etc.

134 Beekman St., NEW YORK.

**The "DAVIS" Pressure Regulator
and Reducing Valve.**

Is the simplest and best for reducing the pressure to Steam Steering Engines, Donkey Engines, Steam Winches and all places requiring a uniform pressure below that of boilers.

No diaphragms, spring or packing.

Cut shows ball weight. We can furnish scale weights if preferred.

MANUFACTURED BY
G. M. DAVIS & CO.
106 N. Clinton St., CHICAGO, ILL.

FOR SALE BY
R. E. Hills, Chicago. C. H. McCutcheon, Buffalo
Geo. Worthington Co., Cleveland.
P.M. Church, Sault Ste. Marie. Jas. Walker & Son, Detroit
Jas. Clements & Son, Bay City, Mich.
Cleveland Ship Building Co., Cleveland.
Chicago Ship Building Co., Chicago.

Selling agents—The McIntosh-Huntington Co., Cleveland, O.; The Detroit Sheet Metal and Brass Works, Detroit, Mich.

NEVERSINK CORK JACKET AND LIFE BELT.

Warranted 24 lb. Buoyancy and full Weight of Cork, as required by U. S. Inspectors
Consolidated Cork Life Preservers. Superior to all others. Ring Buoys and Fenders.

SAFEST. CHEAPEST. Approved and adopted by U. S.
Board of Supervising Inspectors.

Also adopted by the principal Ocean, Lake and River
Steamer Lines as the only Reliable Life Preserver. Vessels
and the trade supplied. Send for catalogue.

Awarded four Medals by World's Columbian Exposition



Metallic
and
Wooden
Life
Boats.



Metallic Life Rafts, Marine Drags.

Manufacturer of Woolsey's Patent Life Buoy, which is the
lightest, cheapest and most compact Life Raft known.

D. KAHNWEILER,
437 Pearl Street, NEW YORK CITY.

SHERIFFS MANUFACTURING COMPANY,

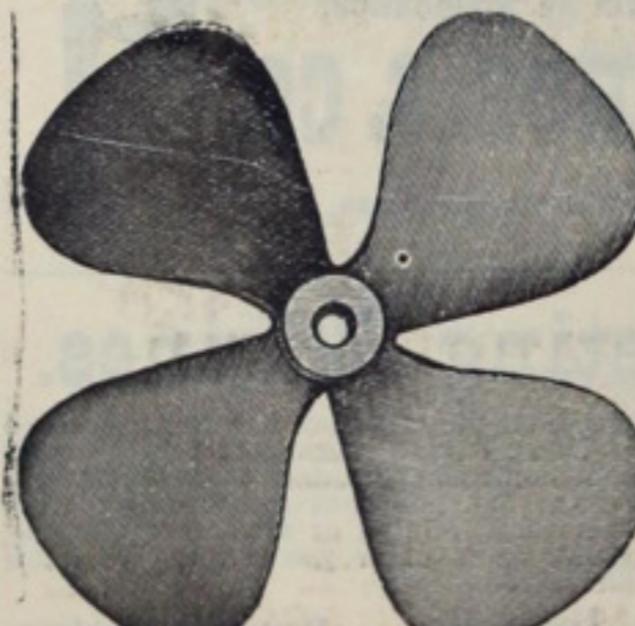
Manufacturers of

Propeller**Wheels.**

MARINE ENGINES AND
REPAIRS.

Milwaukee, Wis.

TELEPHONE S.-163.

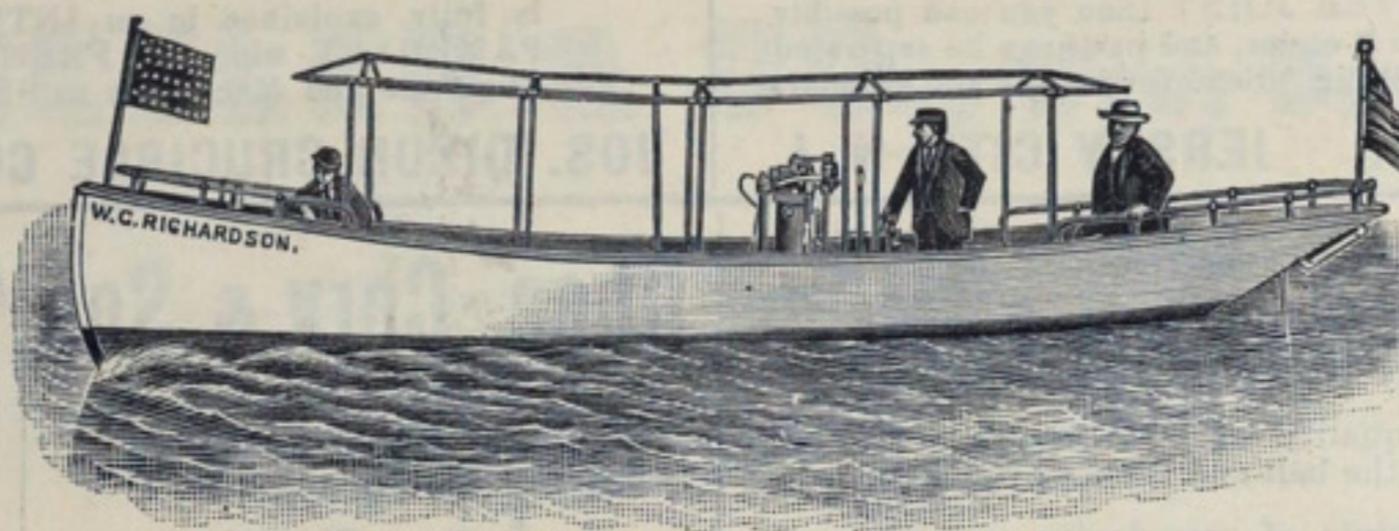


The Wootters Gas Engine.

Especially adapted for launches and ferry boats. Fitted with friction clutch or reversible shaft.

These engines are giving entire satisfaction in the pleasure yacht W. C. Richardson and the delivery launch Lotta.

Prices and particulars furnished on application.



NAPHTHA LAUNCH W. C. RICHARDSON, (Engine 8 horse power—speed 8 miles an hour.)

BUILT BY THE McMYLER MFG. CO., GAS ENGINE DEPARTMENT, 180 Columbus St., CLEVELAND, O.

THE Swain Wrecking Co. E.M. PECK, Pres.

The TUG FAVORITE STATIONED AT CHEBOYGAN, MICH. WITH COMPLETE WRECKING OUTFIT IN CHARGE OF CAPT. P. L. MILLEN.

CAPT. P. L. MILLEN CANADIAN WRECKER SAGINAW STATIONED AT DETROIT, MICH. CHARLES US TO WRECK IN CANADIAN WATERS.

STEAM PUMPS AND SUB-MARINE WORK IN CHARGE OF JOHN S. QUINN. ADDRESS ALL COMMUNICATIONS TO PARKER & MILLEN OFFICE 15 ATWATER ST. WEST DETROIT, MICH.

4 STEAM PUMPS, 10 JACKS, 3 HAWSERS.

1 COAL AND ORE PUMP 3-12 INCH ROTARY. 1-14 INCH WORTHINGTON.

DIVING RIGS AND DIVERS ABOARD AT ALL TIMES.

TELEGRAPH: PARKER & MILLEN, DETROIT, MICH.

For Yachts, Naval Ships, Etc.

10-100 TON JACKS 1-12 INCH HAWSER 1-10 1-9

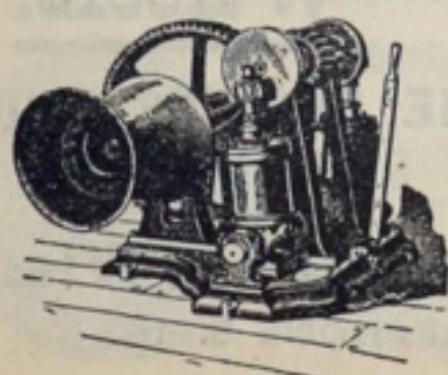
Telegraph: Capt. P. L. Millen CHEBOYGAN, MICH.

Ship Lamps

OIL AND ELECTRIC FIXTURES FOR Steamships, Yachts, &c. GREAT VARIETY OF DESIGNS. Prices and Cuts on Application.

PAGE BROS. & CO.

347 to 357 Cambridge St. Boston, Mass.



Hoisting Engines.

We build them in all sizes from new and improved designs. Every engine thoroughly tested before leaving our shop, and guaranteed to be satisfactory in every case. When in want of a Hoist for marine work, dock work, mining or any other purpose, kindly permit us to name you prices. We know we can please you.

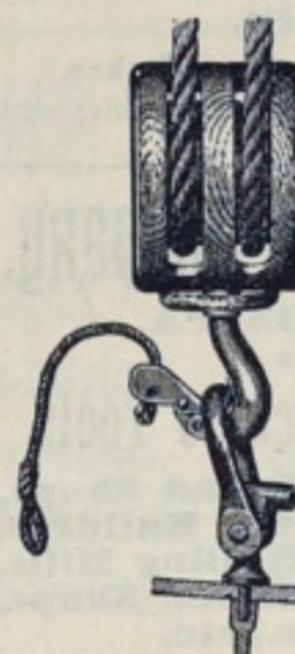
Marine Iron Co., Bay City, Michigan.

Suitable for all purposes requiring from 1 to 200 horse-power, with the lowest possible expenditure.

Engines of the stationary type built for every purpose where a reliable and efficient power is required.

STANDARD AUTOMATIC RELEASING HOOK

For NAPHTHA LAUNCHES and boats of all sizes and descriptions.



Will release a boat immediately in the roughest sea or under speed and can be hooked on without delay or injury to the hands of men hooking it on. For further information apply to

STAND'T AUT. RELEASE HOOK CO.,
22 and 24 State Street, New York.



KATZENSTEIN'S Self-Acting METAL PACKING,

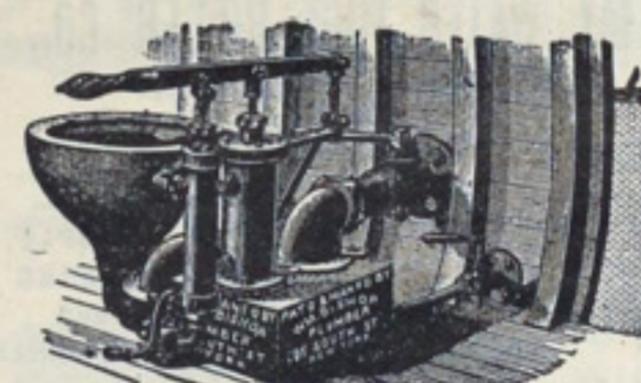
For PISTON RODS, VALVE STEMS, etc., of every description, for Steam Engines, Pumps, etc., etc. Adopted and in use by the principal Iron Works and Steamship Companies, within the last twelve years, in this and foreign countries.

FLEXIBLE TUBULAR METALLIC PACKING, for slip-joints on Steam Pipes, and for Hydraulic Pressure; also METAL GASKETS for all kinds of flanges and joints.

DOUBLE-ACTING BALANCED WATER-TIGHT BULKHEAD DOORS for Steamers. Also Agents for the McColl-Cumming PATENT LIQUID RUDDER BRAKE. For full particulars and reference, address:

L. KATZENSTEIN & CO.,
General Machinists, Brass Finishers, Engineers' Supplies,
357 West St., New York.

PATENT PUMP WATER CLOSET.



For Yachts, Naval Ships, Etc.

WM. BISHOP'S SONS,
PLUMBING and STEAM FITTING

"MARINE SPECIALTIES."

Patentees and Manufacturers of the only Pump Water Closet that is safe below water line.

BRASS AND COPPER PUMPS,
LAVATORIES, ETC.

205 South St., - New York.
724 Third Ave., Brooklyn, N.Y.
Telephone.

MIERS GORYELL
21 E. 21st Street, NEW YORK.

Consulting Mechanical Engineer.

Plans, Specifications and Superintendence. Marine and Water Works Engines and Boilers.



JENKINS BROS. New York, Boston, Philadelphia, Chicago

'96 JENKINS '96

Is the Perfection of Joint Packing, Instantaneous, Does not Squeeze out and not necessary to follow up joint. We guarantee it to last for years on any and all pressures of steam or any kind of joint where packing is required. Does not rot, burn or blow out, therefore the best for all purposes. Call for and insist on having '96 JENKINS '96 stamped like cut.

C. H. McCUTCHEON,
(Successor to SAMUEL McCUTCHEON.)

Copper, Tin and Sheet Iron Manufactory,
Steamboat and Engineers' Supplies.

All kinds of Brass Cocks, Globe Valves and Couplings, &c. Iron Pipe and Fittings, and Mill Supplies. Rubber Belting, Hose and Packings, Springs, Valves, &c., Leather Belting and Usudurian Packing.

Telephone No. 68.

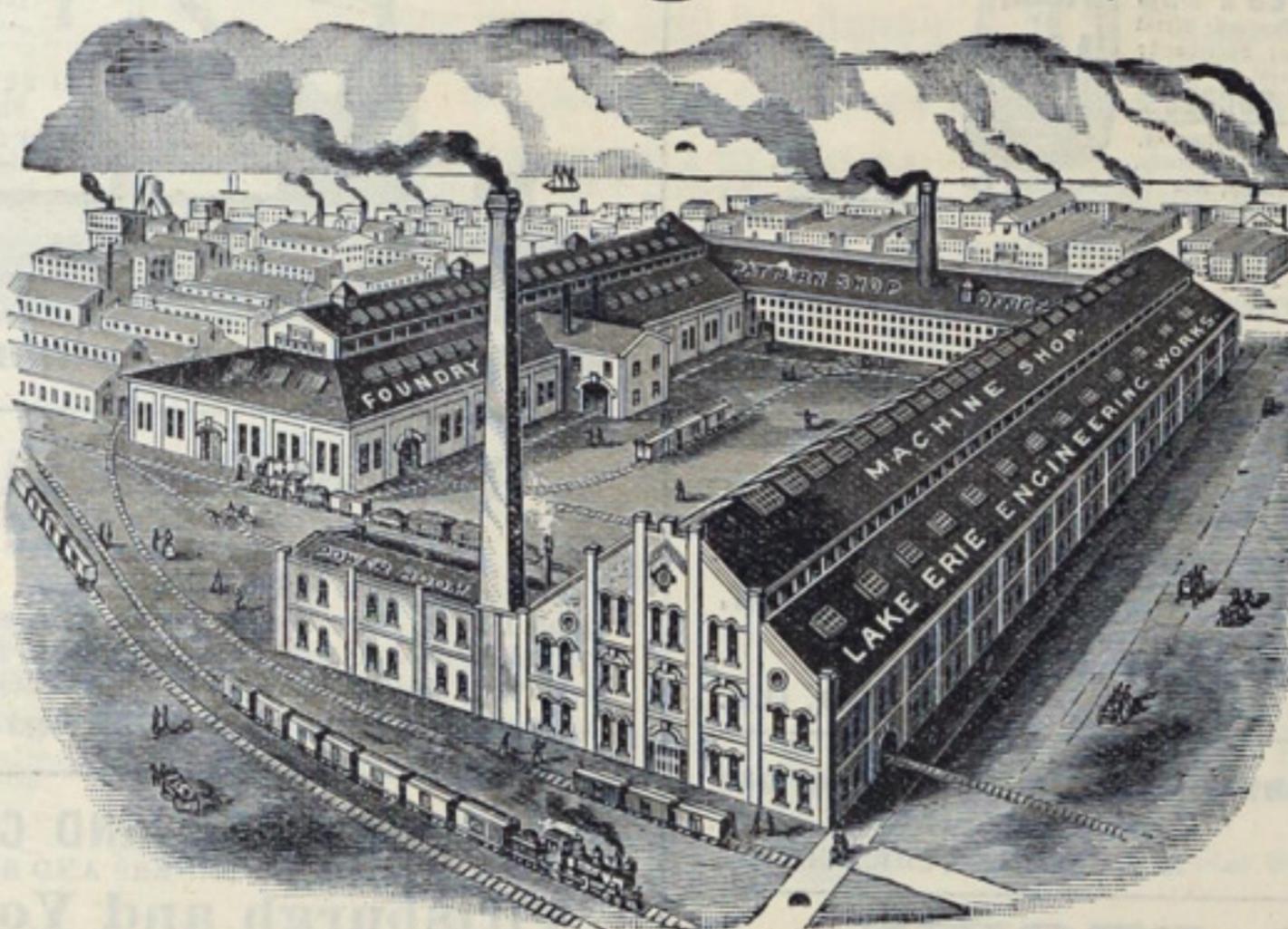
No. 18 Ohio Street, BUFFALO, N.Y.

Lake Erie Engineering Works, Buffalo, N.Y.

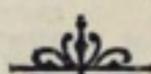
RICHARD HAMMOND, Pres't.



**Steam Engines,
Compound, Triple
and Quadruple
Expansion
Engines,
From 250 to 10,000
Horse Power
For Marine and
Stationary
Service.**



JOHN COON, Sec'y and Treas.



**Special Designs
for Cable
Railways and
Electric Power
Plants.**

**The Best Economy
and Regulation
Guaranteed.**

THE BEST EQUIPPED PLANT IN AMERICA.



1897 Blue Book of American Shipping.

"IS THE BEST BOOK OF THE KIND EVER PUBLISHED,"

at least that seems to be the almost universal verdict of purchasers and advertisers.

"A Book that 'all hands' needs."—Marine Journal, New York, N. Y.

"Is to American shipping what Lloyd's Register is to British shipping."—Cleveland Leader.

"The field has been extended to cover the entire American marine."—Lake Marine News Press Despatches.

"The book is particularly valuable for the names which it presents of ship and engine builders; vessel owners having fleets; purchasing agents of principal passenger and freight steamer lines, etc."—Iron Age, New York.

"One list of 500 names and addresses includes owners of 2,400 of the largest vessels in the United States."—American Shipbuilder.

In a letter enclosing a check for three copies, the director of the Bureau of American Republics, Washington, says: "It is interesting to all the trade interests of the country, and must be invaluable to the shipping interests."

Order a copy, Price \$5, and if you are not satisfied with the book we will pay express both ways and credit the \$5.

BLUE BOOK OF AMERICAN SHIPPING, 409 Perry-Payne Bldg., CLEVELAND, O.

The Coast Line to MACKINAC

—TAKE THE



**TO MACKINAC
DETROIT
PETOSKEY
CHICAGO**

New Steel Passenger Steamers

The Greatest Perfection yet attained in Boat Construction—Luxurious Equipment, Artistic Furnishing, Decoration and Efficient Service, insuring the highest degree of **COMFORT, SPEED AND SAFETY**

FOUR TRIPS PER WEEK BETWEEN

Toledo, Detroit and Mackinac

PETOSKEY, "THE SOO," MARQUETTE
AND DULUTH.

LOW RATES to Picturesque Mackinac and Return, including Meals and Berths. From Cleveland, \$18; from Toledo, \$15; from Detroit, \$13.50.

DAY AND NIGHT SERVICE.

Between Detroit and Cleveland

Connecting at Cleveland with Earliest Trains for all points East, South and Southwest and at Detroit for all points North and Northwest.

Sunday Trips June, July, August and Sept. Only

EVERY DAY BETWEEN

Cleveland, Put-in-Bay, Toledo

Send for Illustrated Pamphlet. Address

A. A. SCHANTZ, G. P. A., DETROIT, MICH.

The Detroit & Cleveland Steam Nav. Co.

**\$2.50 CLEVELAND
To BUFFALO
ALSO DAILY LINE
BETWEEN
CLEVELAND AND TOLEDO.
Via "C. & B. LINE."**

Steamers "City of Buffalo," (new)
"State of Ohio" and "State of New York"

DAILY TIME TABLE.

Sunday Included May 30 to October 3.

Lv. Cleveland 7:00 P.M. | Lv. Buffalo 7:30 P.M.
Ar. Buffalo 7:30 A.M. | Ar. Cleveland 7:30 A.M.

CENTRAL STANDARD TIME.

Take the "C. & B. Line" steamers and enjoy a refreshing night's rest when enroute to Buffalo, Niagara Falls, Toronto, New York, Boston, Albany, 1,000 Islands, or any Eastern or Canadian Point.

Cheap Excursions Weekly to Niagara Falls.

Send 4 cents postage for tourist pamphlet. For further information ask your nearest Coupon Ticket Agent or address,

W. F. HERMAN, T. F. NEWMAN,
GEN'L PASS. AGT. GEN'L MANAGER.

CLEVELAND, O.

A PPPOINTMENTS of Captains and En-
gineers for 1897.

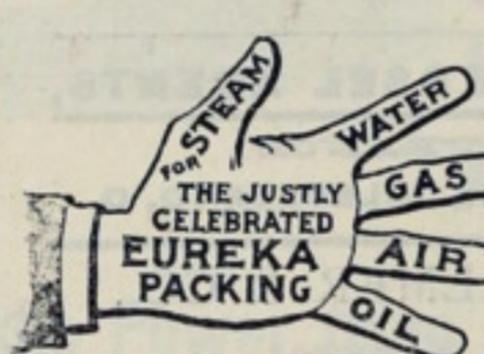
The most complete published. Arranged for reference by fleet and by vessels with names alphabetically arranged.

Necessary to everyone who has business with captains or engineers.

PRICE \$1.00.

MARINE REVIEW.

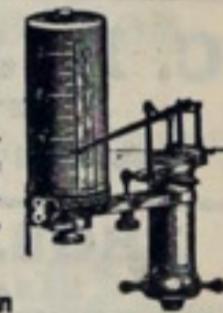
409 Perry-Payne Bldg., Cleveland, O.



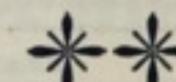
YOU ARE A BACK NUMBER

if you don't know how to use an INDICATOR or carry in your closet some EUREKA. Send for our catalog and easy terms of payment for INDICATOR.

JAS. L. ROBERTSON & SON,
204 Fulton St., N.Y. 12 Pearl St., Boston



**EVERY MARINE ENGINEER
on the Lakes, and every second
who is studying for first class
papers, ought to possess**



Reed's Engineers' Hand Book

(Fifteenth Edition.)

Containing 600 engravings and a portfolio of drawings of all parts of marine engines.

It has always sold for \$4.50 and \$5. Until Dec. 1 any subscriber to the REVIEW may have a copy sent post paid by enclosing this advertisement and \$4 to

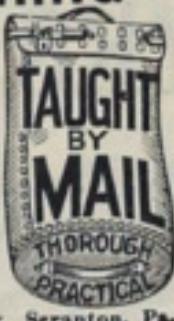
Marine Review,

409 Perry-Payne Bldg., CLEVELAND, O.

BOOK DEPT.

STEAM ENGINEERING

(Stationary, Locomotive, Marine); Mechanical Drawing; Architectural Drawing; Machine Design; Electricity; Architecture; Plumbing; Railroad, Municipal, Hydraulics, Engineering; Surveying and Mapping; Metal Pattern Cutting; Bookkeeping; Shorthand; English Branches: Mining; Metal Prospecting. All who GUARANTEED SUCCESS. Fees Moderate, Advance or Installments. Circular Free; State subject you wish to study. International Correspondence Schools, Box 965, Scranton, Pa.



HARVEY D. GOULDER,
LAWYER AND PROCTOR IN ADMIRALTY,
CLEVELAND, O.

ALBERT J. GILCHRIST, PROCTOR IN ADMIRALTY,
No. 604 PERRY-PAYNE BLDG., CLEVELAND, OHIO.

AMBROSE V. POWELL, C.E., * * Consulting Engineer.
Specialties: Designing and Construction of DRY DOCKS, Harbor Works, Docks and Plants for Handling Coal and Ore.
Office, 507 Chamber of Commerce, CHICAGO, ILL.

C. E. KREMER, Attorney and Counselor-at-Law and Proctor in Admiralty.
Rooms 14, 15 and 16, Bryan Block, 164 LA SALLE ST., CHICAGO, ILL.

HARVEY L. BROWN,
Counselor at Law and Proctor in Admiralty,
35 White Building, BUFFALO, N. Y.

HAWGOOD & MOORE
Vessel and Insurance Agents,
Residence Phone, Doan 446—W. A. Hawgood.
Long Distance Tel. 2395. 608 Perry-Payne Bldg., CLEVELAND, O.

W. C. RICHARDSON,
VESSEL AND MARINE INSURANCE AGENT.
Office Telephone 338. Residence Telephone 2938. Nos. 606 & 607 Perry-Payne Bldg., Cleveland, O.

J. H. BARTOW, TELEPHONE 717.
Vessel and Insurance Agent,
611 and 612 Perry-Payne Bldg., Cleveland, O.

JOHN MITCHELL, JOHN F. WEDOW, ALFRED MITCHELL.
MITCHELL & CO.,
Vessel and Insurance Agents,
508, 509 and 510 Perry-Payne Building, CLEVELAND, OHIO
Office Telephone, 787. Residence, John Mitchell, 3506.

C. R. JONES & CO., VESSEL AGENTS,
FIRE AND MARINE INSURANCE.
Nos. 501, 502 and 503 Perry-Payne Bldg., CLEVELAND, O.

THOS. WILSON,
MANAGING OWNER
WILSON'S TRANSIT LINE,
Gen. Forwarder.
Freight and Vessel Agent.
CLEVELAND, O.

J. T. ROSE. FRANK B. LAZIER.
ROSE & LAZIER,
Vessel Agents and Brokers,
and Marine Insurance,
16 Board of Trade,
DULUTH, MINN.

PATENTS
QUICKLY SECURED. Trade-marks and Copyrights registered and patent business of every description promptly and skillfully conducted at lowest rates. Inventions introduced, companies formed, and PATENTS SOLD ON COMMISSION. 25 years' experience. Highest references. Send us model, sketch or Photo. of invention, with explanation, and we will report whether patentable or not, free of charge. OUR FEE PAYABLE WHEN PATENT IS ALLOWED. When patent is secure, we will conduct its sale for you without extra charge. 32-PAGE HAND-BOOK and list of 200 inventions wanted mailed to inventors free upon request. This is the most complete little patent book published and every inventor should WRITE FOR ONE. **H. B. WILLSON & CO.**, Patent Solicitors, Le Droit Bldg., WASHINGTON, D. C.

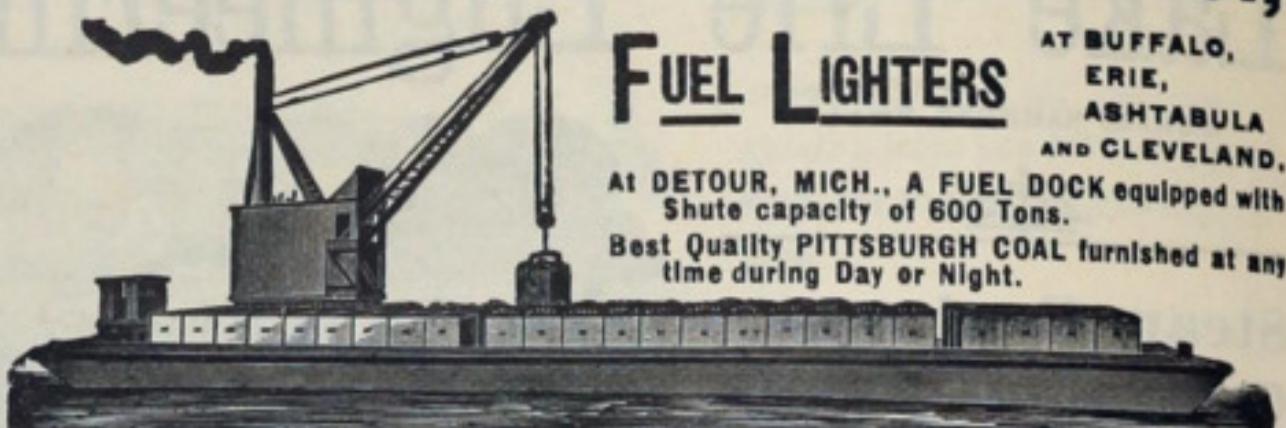
PALMER & CO.,
VESSEL AGENTS
AND UNDERWRITERS,
713 Perry-Payne Bldg., Cleveland, Ohio.
Telephone 644.

J. J. H. Brown. Edward Smith.
J. B. Rodgers.
BROWN & CO.,
Vessel and Insurance Agents,
202 Main St.,
BUFFALO, N. Y.

White, Johnson & McCaslin,
ATTORNEYS-AT-LAW,
AND
Proctors in Admiralty,
26-27 Blackstone Building,
CLEVELAND, OHIO.

ORESTES C. PINNEY,
Lawyer and Proctor in Admiralty.
Rooms 722 and 723 Perry-Payne Bldg
CLEVELAND, OHIO.
Telephone 2585.

O. W. ELPHICKE. JAS. A. MYERS.
CALVIN CARR.
C. W. ELPHICKE & CO.
GENERAL INSURANCE AGENTS,
Room 10, No. 6 Sherman St., Chicago, Ill.

Pickands, Mather & Co.,

FUEL LIGHTERS AT BUFFALO,
ERIE,
ASHTABULA
AND CLEVELAND.
At DETOUR, MICH., A FUEL DOCK equipped with
Shute capacity of 600 Tons.
Best Quality PITTSBURGH COAL furnished at any
time during Day or Night.

Western Reserve Building, CLEVELAND, O.

Ohio & Pennsylvania Coal Co.

FUEL DEPARTMENT.
MINERS AND SHIPPERS,

Youghiogheny and Ohio Steam Coals. Steamboats, Tugs, etc., Coaled day or night, Docks Foot WEST RIVER STREET. WHISKEY ISLAND GOVERNMENT PIER and C. & P. R. R. SLIPS. Also STEAM LIGHTER—Equipped with Revolving Derrick and (100) two ton buckets.

Telephone 1608. Office, 130 West River St., CLEVELAND, OHIO.

THE PITTSBURGH AND CHICAGO GAS COAL CO.

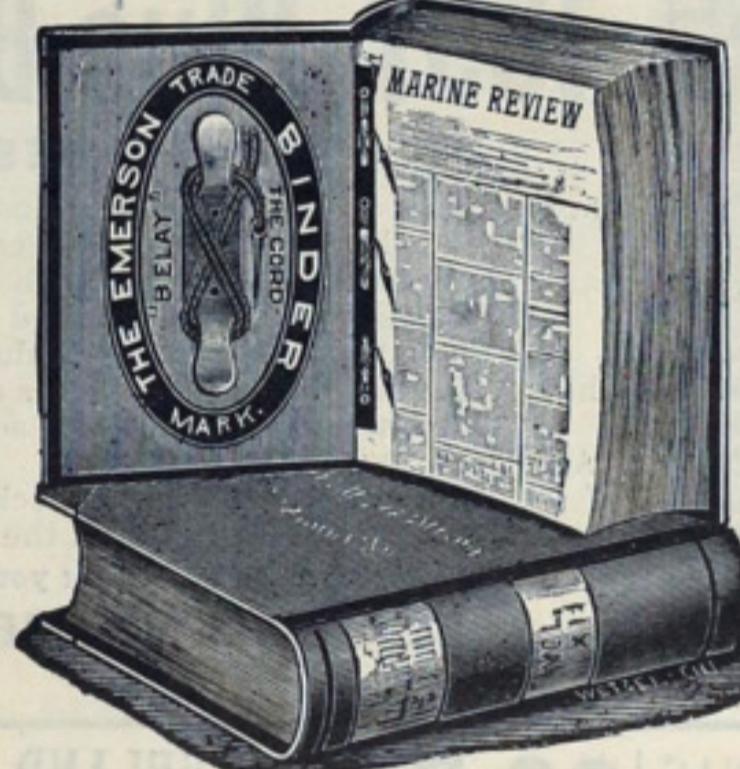
MINERS AND SHIPPERS OF

Pittsburgh and Youghiogheny Coal.

Fuel Docks West Side of Main River, Cleveland, Ohio, just above Main St. Bridge. Latest equipment for rapid fueling of Steamers at all hours, day or night. Fuel Lighter 300 tons capacity; buckets 2½ tons capacity.

Office 1888.
Telephone 1590.
Ore Dock, 2413

J. A. DONALDSON, Agent,
420-421 Perry-Payne Building.

**ONE OF THESE BINDERS**

that will hold 52
NUMBERS
of the

MARINE REVIEW,

Will be mailed to
any address on
receipt of \$1.

MARINE REVIEW...

409 Perry-Payne Bldg.,
CLEVELAND, O.

H. A. BARR, PRESIDENT, F. H. VAN CLEVE, SECY. CAPT. GEO. BARTLEY, SUPT.
Escanaba. Escanaba.

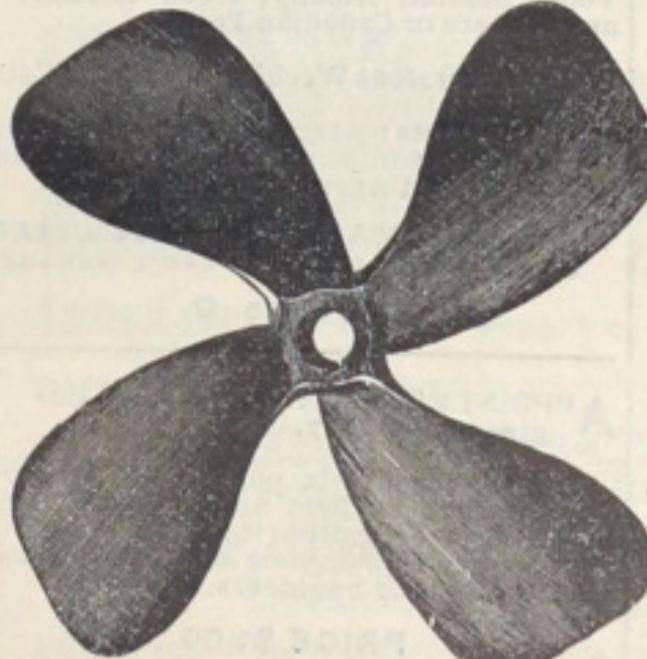
ESCANABA TOWING & WRECKING CO., Escanaba, Mich.

Tugs, Lighters, Steam Pumps, Hawser, Hydraulic Jacks and Diving Appliances always ready
TUG MONARCH, Engine Compound, Cylinder 16 and 30 inches diameter, 30 inch
Stroke, Steam Pressure Allowed, 125 pounds.
TUG DELTA, Cylinder 20 by 22, Steam Pressure Allowed, 105 pounds.
TUG OWEN, Cylinder 20 by 20, Steam Pressure Allowed, 104 pounds.

CENTRIFUGAL PUMPS, Seven and Fourteen Inch Suction**H. G. TROUT,
KING IRON WORKS,**

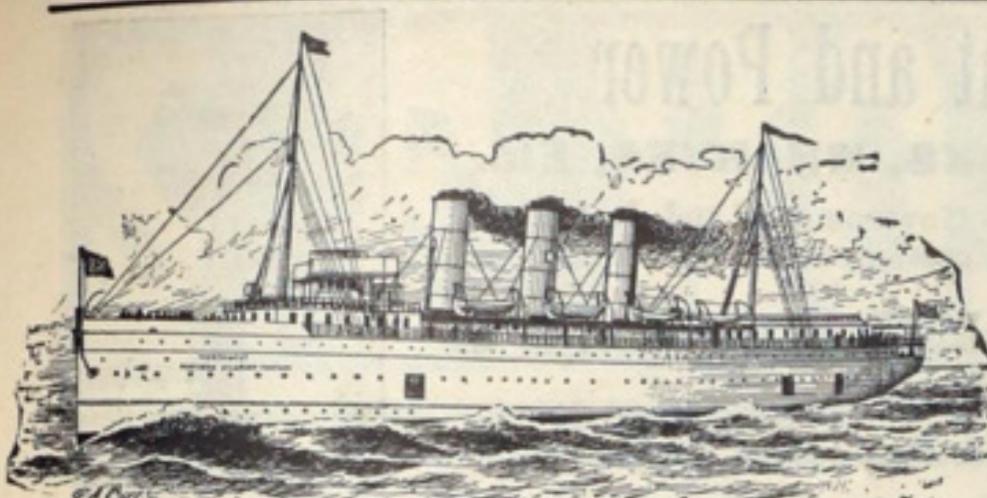
BUFFALO, N. Y.

MANUFACTURERS OF
TRIPLE EXPANSION,
THREE CYLINDER,
FORE AND AFT
And STEEPLE COMPOUND
MARINE ENGINES,
High and Low Pressure Engines,
Sectional Propeller,
Tug and Yacht Wheels,
Cowles Aluminum and Manganese
Bronze Propeller Wheels.



These Wheels are noted for their extra
speed, towing power and proportionate saving of coal.

PRICES QUOTED ON APPLICATION.



Shippers of Coal by Rail and Water.

RAPID FUELING DOCKS, DETROIT RIVER.**JAMES GRAHAM & CO.,**

Foot Twenty-first St., Detroit,

Below Routes of Passenger and Car Ferry Lines.

Pockets and Chutes arranged for different types of vessels.

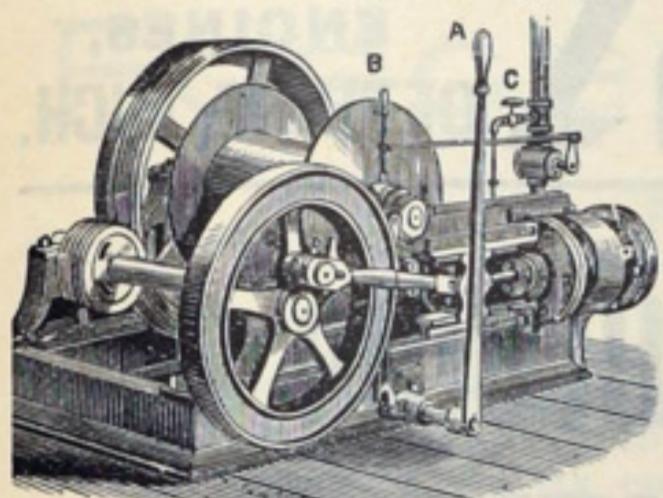
BEST STEAM COAL.

Large Supplies and every effort to give dispatch, day and night. Wide stretch of river for tows, and plenty of water at dock at all times.

Office 1005 Chamber of Commerce. Phone 2083.

WILLIAMSON BROS.

Cor. Richmond and York Sts., PHILADELPHIA, PA.

Hoisting Engines and Ship
Steering Engines.With either Frictional Spur or Worm
Gear of various Patterns to
suit all purposes.Over 150 of the largest and most
modern lake steamers have
our steerers.**THE W. L. SCOTT CO.**

Wholesale Dealers in

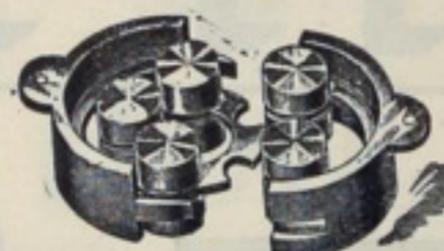
Shamokin, Wilkesbarre, and Hazleton-Lehigh

COALS.

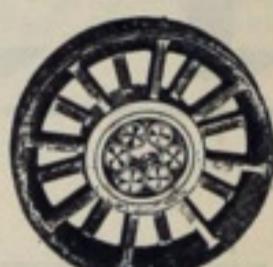
Mansfield Steam Coal.

FUELING VESSELS a specialty, either from dock or steam scow Mansfield, capacity 300 tons, in buckets, which gives quick dispatch. Boats coaled day or night. Docks lighted with electricity and equipped with steam derricks.

Fueling Office at Canal Dock, ERIE, PA.

FERRALL'S PATENT**Long Bearing Self-Adjusting 5 Roll Sheave**

Has no rivets in its construction, therefore is made stronger, having an interior separator to prevent the rolls from touching each other, and an interior rail to guide the rolls.

**BAGNALL-LOUD BLOCK CO.**

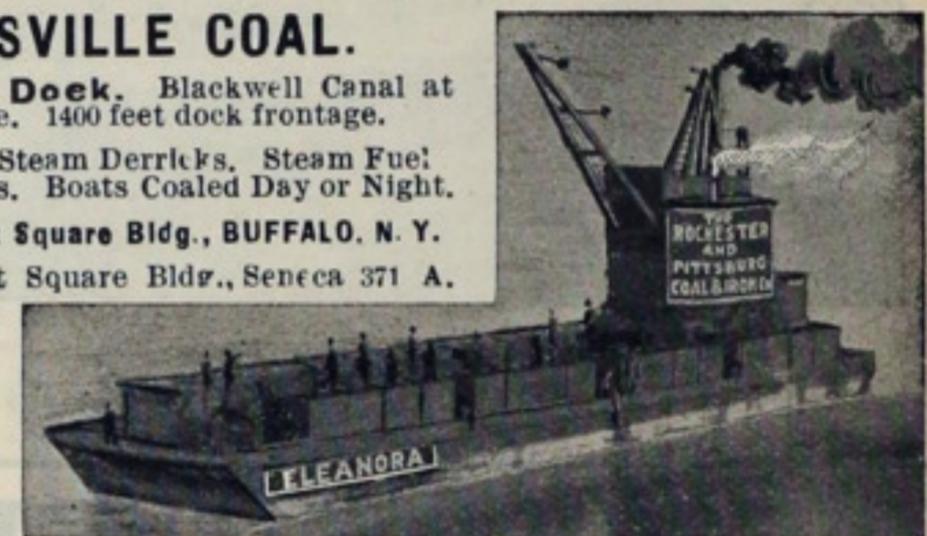
BOSTON, MASS

The Rochester & Pittsburgh Coal & Iron Co.**REYNOLDSVILLE COAL.****Steamboat Fuel Dock.** Blackwell Canal at Michigan St. Bridge. 1400 feet dock frontage.

Steam Elevator and 4 Steam Derricks. Steam Fuel Scow, Capacity 550 Tons. Boats Coaled Day or Night.

OFFICE: 694 ELLICOTT SQUARE BLDG., BUFFALO, N.Y.

TELEPHONES: ELLICOTT SQUARE BLDG., SENICA 371 A. DOCK, SENICA 371 D.

WM. H. HAZEN,
Dock Superintendent.**10,000 IN USE.****Unaffected by Weather.****Portable, Self Contained.****800 to 4000 Candle Power from KEROSENE OIL.**

Especially adapted for Contractors, Quarries, Shovels, Railroad Construction, Dredges, Bridge and Dock Builders, Water-Works, Brick Yards and Coal Docks.



400 RAILROADS and over 300 CONTRACTORS now use the WELLS LIGHT.

The Wells Light Mfg. Co.

EDWARD ROBINSON, Sole Proprietor.

46 Washington Street,

NEW YORK.

MARINE VALVE OIL FOR INTERNAL LUBRICATION.Marine Valve,
Renown Engine,Eldorado Engine,
Crank Case,Victor Signal,
Dark Lubricating,Mineral Seal,
Head Light,Artic Cup Greases,
and Lard Oils.

— CARRIED IN STOCK AT THE —

STANDARD OIL COMPANY'S MARINE DEPOT,

TELEPHONE 77.

123 River Street, CLEVELAND, O.

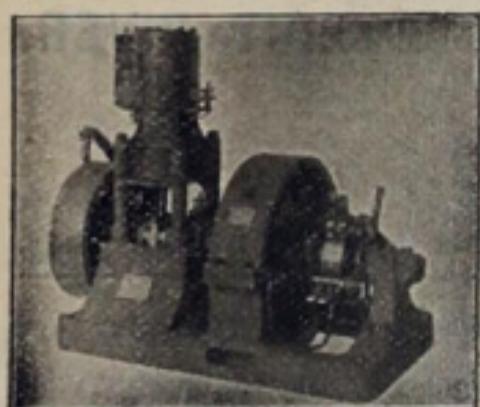
MAIN OFFICE TELEPHONE 682.

ALSO FOR SALE
BY
**STANDARD OIL
COMPANY,**Chicago, Ill., No. 5 Wabash Ave.
Racine, Wis.
Milwaukee, Wis., Broadway & Mason.
Sheboygan, Wis.
Manitowoc, Wis.
Green Bay, Wis.Marinette, Wis.
Oshkosh, Wis.
Duluth, Minn.
West Superior, Wis.
Hancock, Mich.
Marquette, Mich.Buffalo, N.Y.
Sault Ste. Marie, Mich.
West Bay City, Mich., M.C.Ry. & 10th St.
Saginaw, Mich., Eighth & Sears Sts.
Detroit, Mich., 46 Jefferson.
Toledo, O., Summit & Monroe Sts.ATLANTIC REFINING COMPANY, French & 16th Sts., Erie, Pa.
D. ROBESON, Port Huron, Mich.
W. S. MCKINNON, Ashtabula Harbor, O.
HULL & BAND, Huron, O.EDWARD BRAMMALL, Eton Harbor, Mich.
BABY & DALE, St. Clair, Mich.
N. C. ALLEN, Lorain, O.
A. F. HARRINGTON, Conneaut Harbor, O.A. H. McGONAGIL, South Chicago, Ill.
MARINE SUPPLY CO., Fairport, O.

F. KRANZ, Sandusky, O.

THE M. I. WILCOX CORDAGE & SUPPLY CO., Toledo, O.

RENOV ENGINE OIL FOR EXTERNAL LUBRICATION



Complete Electric Plants for Light and Power

On STEAMSHIPS, WHALEBACKS, YACHTS, DOCKS, WHARVES, Etc.

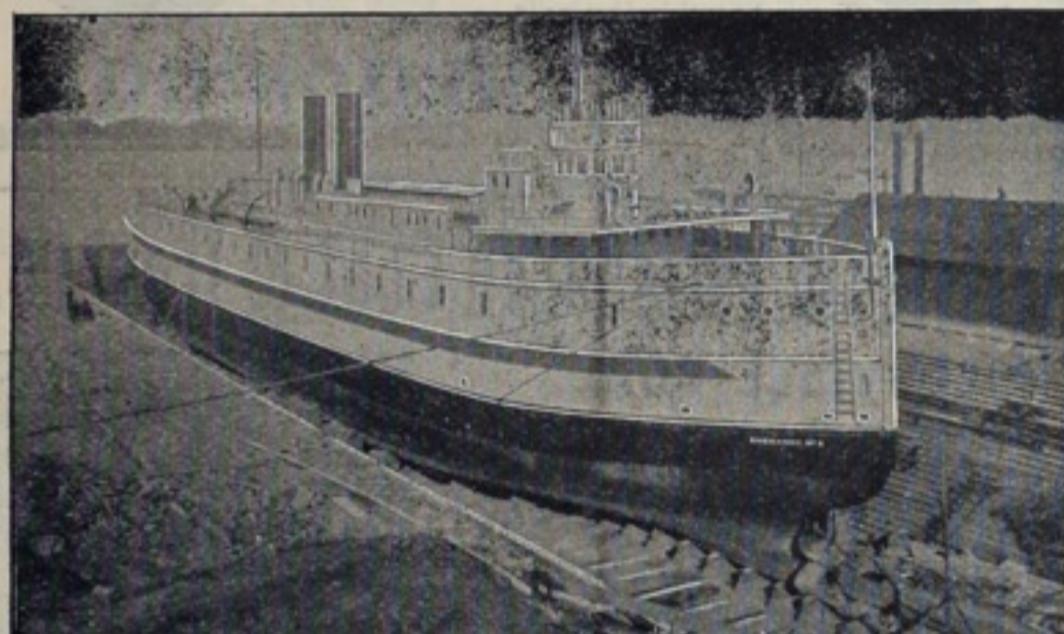
Our system is complete in every detail. All our appliances are made to Governmental and Insurance requirements and are perfect. Write for prices and catalogues.

General Electric Company.

Schenectady, N. Y. Chicago, Ill. Detroit, Mich. Buffalo, N. Y. Columbus, O.
Boston, Mass. Philadelphia, Pa. Baltimore, Md. Portland, Ore. San Francisco, Cal.
New York, N. Y. New Orleans, La.



FRONTIER IRON WORKS MARINE ENGINES, DETROIT, MICH.



Shenango No. 2, 300 feet long, 54 feet beam.

THE BETHLEHEM IRON CO.

Works & Principal Office, South Bethlehem, Penn.

Marine Engine Forgings

of all descriptions, made either **SOLID** or **HOLLOW** from Fluid-Compressed Hydraulic-Forged Open Hearth Steel.

Ship-Plates. Boiler-Plates. Tank-Plates.

NEW YORK OFFICE, - - - 100 Broadway.
PHILADELPHIA OFFICE, - - - 421 Chestnut St.
CHICAGO OFFICE, - - - Marquette Bldg.

The United States Standard Register of Shipping.

Providing the only Standard Classification based on Construction Rules
Designed for Lake Vessels.

Classed Vessels Receive the Lowest Rates of Insurance.

SURVEYORS.

SINCLAIR STUART, Surveyor of Iron and Steel Construction and Engineer Surveyor.

for District comprising Lakes Superior, Michigan and Huron and Lake Erie, as far East as, and including Cleveland, O.

EDWARD CASKIN, Potter Building, Main Street, Buffalo, N. Y., Surveyor for District comprising Lake Ontario and Lake Erie, as far West as, but not including Cleveland, O.

Application for survey of vessels and subscriptions to Register Book will be received by the surveyors or at the office of

The United States Standard Steamship Owners', Builders' & Underwriters' Ass'n, Ltd.

Post Building, 16 and 18 Exchange Place, NEW YORK.

CRAIG SHIP BUILDING CO.

TOLEDO, OHIO,

Metal & Wooden Ship Builders.

New Dry Dock—450 feet long, 110 feet wide on top, 55 feet wide on bottom, 16 feet of Water on Sill.

**Repairs to Metal and Wooden Ships
A Specialty.**

Cuddy-Mullen Coal Co.

Miners and Shippers of Steam Coal

FUELING DEPARTMENT FACILITIES:

CLEVELAND HARBOR—

Car Dumper; Eight Pockets 1,000 tons capacity;
Three Steam Derricks; Lighter.

DETROIT RIVER BRANCH—

Amherstburg. Four Pockets and Three Steam Derricks; sandwich, Ten Pockets and Two Steam Derricks.

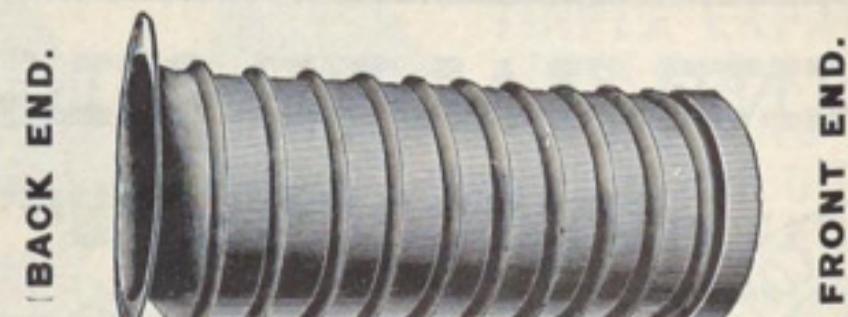
SAULT RIVER BRANCH—

Two Docks at Detour (formerly known as the Anthony and Watson Docks) Equipped with Pockets and Steam Derricks.

Good Coal; Courteous Attention; Quick Dispatch.

General Offices: Perry-Payne Bldg., Cleveland, O.

PURVES' RIBBED STEEL BOILER FURNACE FLUE.



With this style of Furnace Flue, the rivets at the "back end" are out of the line of fire, and all that has to be done to remove it is to cut out the rivets at the ends and slip it through the front; and to replace it, simply to slip it back in its place and rivet up the ends again without disturbing any other part of the boiler. No smith work is required to fit it in a boiler or to re-fit it when replaced. It is ready for use as it comes from the manufacturers. This style of Flue has been in use six years without a single complaint.

Over 16,000 of Purves' Ribbed Steel Furnace Flues in successful use in Marine Boilers.

ELLIS & EAVES SYSTEM OF INDUCED OR SUCTION DRAFT.

CHARLES W. WHITNEY,

Sole Agent for the United States and Canada,
Bowling Green Building, 5 to 11 Broadway, New York City.

S. F. HODGE & CO.

MARINE ENGINES,
PROPELLER WHEELS,
DECK HOISTERS,
MARINE REPAIRS.
320 ATWATER STREET,
DETROIT, MICH.

THE BABCOCK & WILCOX CO.

29 CORTLAND STREET,
NEW YORK.

FORGED STEEL WATER-TUBE MARINE BOILER,

Light, durable, easily cleaned and inspected. Only straight tubes are used.

The largest cargoes on the Lakes are carried by steamers using BABCOCK & WILCOX boilers.

The fastest of the six composite Gunboats recently constructed for the U. S. N. (MARIETTA and ANNAPOLIS) are equipped with these boilers.

Boilers also ordered for U. S. N. CHICAGO and ATLANTA.

BAR IRON

THE BOURNE-FULLER CO.

CLEVELAND, O.

PIG IRON

SHIP PLATES,

BOILER PLATES,

ANGLES,

BEAMS,

BARS,

BOAT SPIKES,

CHANNELS,

CLINCH RINGS,

SALES AGENTS:

THE CAMBRIA IRON CO.

— Mfrs. of Open Hearth and Bessemer Steel. —

De Grauw, Aymar & Co.,
34-35 South Street,
NEW YORK, N. Y.



Sole Selling Agents
in the
United States
for

TYZACK'S STOCKLESS ANCHORS

Over 100
of these Anchors
on Lake Vessels.

DETROIT SHEET METAL AND BRASS WORKS

No. 64-66-68-70-72
ORLEANS STREET,
DETROIT, MICH.

Jobbers of..... Pipe, Valves, Fittings, Packing, Oil and
Engineers Supplies.

Contractors for High Class Steam Fitting, Steam Heating,
Plumbing, Copper Work, and all
Classes of Sheet Metal Work.

Manufacturers of Clark's Patent Metallic Life Raft, Side
Lights, Marine Hardware, Hurricane,
Cabin and Platform Lamps, Trip
Gongs, etc.

Agents for..... Laidlaw - Dunn - Gordon Steam Pumps,
Warren Webster's Specialties, and
Buffalo Forge Co.'s Fans, Engines and
Heaters.

Engineers can be waited on promptly day or night.

Steamboat Fuel at Ashtabula.

Large Supplies of Best Quality.

Lighter

Carrying
Different
Grades
at all
Times.



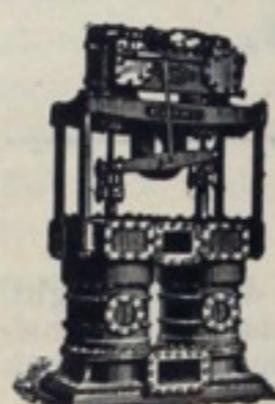
M. A. HANNA & CO.,

Main Office, Perry-Payne Bldg., Cleveland. Miners and Shippers.

THE GEO. F. BLAKE MFG. CO.

BUILDERS OF

MARINE PUMPS



Single and Duplex Pumps for Boiler Feed,
Fire or Bilge Service—Vertical and Horizontal.

Vertical and Horizontal Pumps, Air Pumps
for Surface and Jet Condensers.

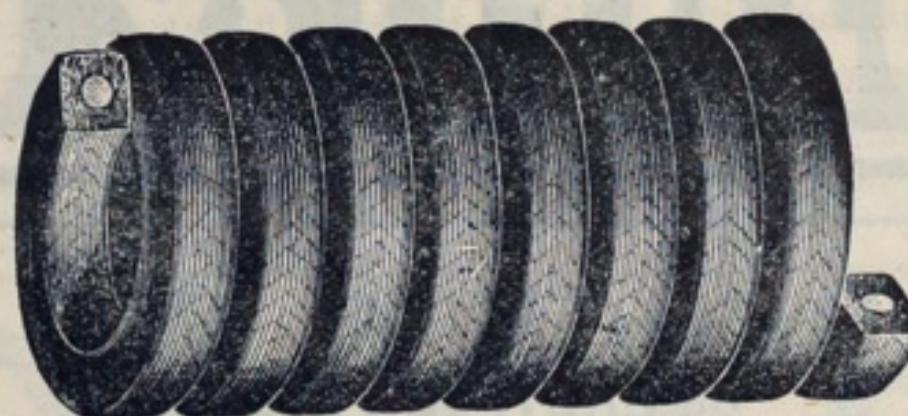
95 and 97 Liberty St., NEW YORK.

AIR PUMP ON
U.S. CRUISER NEW YORK.

"HONEST JOHN,"

193-195 Bank St.,
CLEVELAND, O.

MADE BOTH
STRAIGHT
AND SPIRAL.



PUT UP
IN
BOXES.

HYDRAULIC RAINBOW CORE PACKING.

WRITE US FOR TESTIMONIALS.

16-24 Woodward Avenue,
DETROIT, MICH.

PEERLESS RUBBER MFG. CO.,
16 Warren Street,
NEW YORK.

202-210 So. Water St.,
CHICAGO, ILL.

The Cleveland Dry Dock Co.



148 Elm St.,
Cleveland, O.

Telephone 1616.

Resid. Phone 3631.

REPAIRING A SPECIALTY.

Dimensions of Dock:

Lth. over all, 380 ft.
Lth. on blocks, 340 ft.
Width of gate, 50 ft.
Depth over sill, 20 ft.

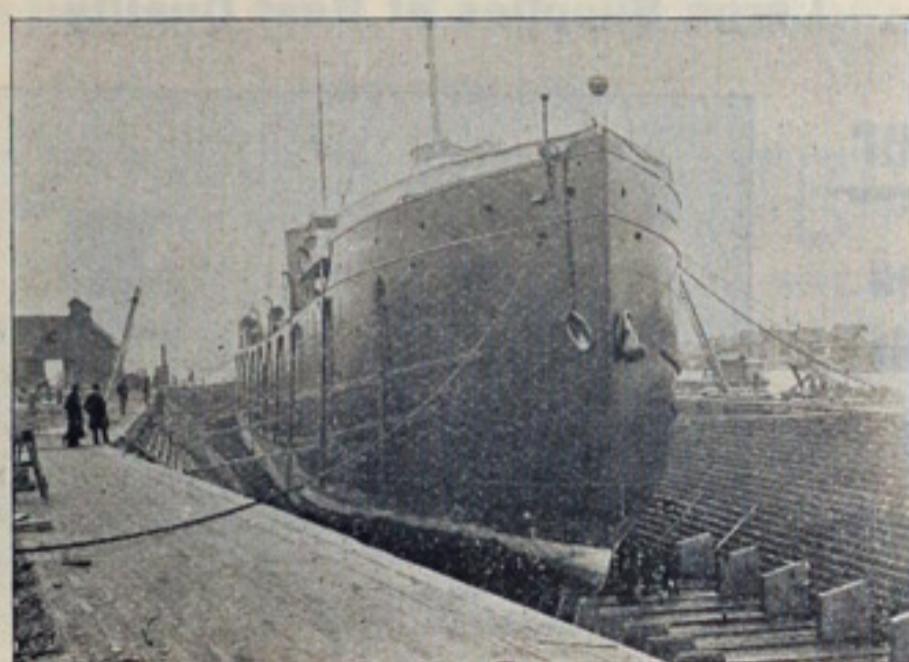
Capt. W. W. BROWN,
Sec'y & Mgr.

AMERICAN STEEL BARGE CO. STEEL and METAL SHIPS

Of all classes built on the shortest possible notice at our yards at

West Superior, Wis., and also at Everett, Wash.

Plates &
Material
Always
on hand
to Re-
pair all
kinds of
Metal
Ships in
Shortest
Time.



Best
Quality
of Oak
in stock
for Re-
pairing
Wooden
Vessels
of all
Classes.

SIZE OF DOCK.

Length, extreme.....	537 feet.	Entrance, Top.....	55 feet 9 in
Breadth, Top	90 " 4 in.	Entrance, Bottom.....	50 "
Breadth, Bottom	52 "	Depth over Sills	18 "

LARGEST DRY DOCK ON THE LAKES.

Prices for Repairs and Docking same as at lower lake ports

SUPERIOR, WIS.

A number of Propeller Wheels in stock at Dry Dock.

H. C. BURRELL

MARINE REPORTER, DETROIT.

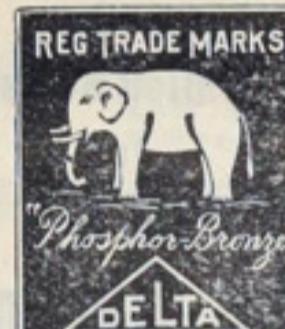
Small boat on the river at all hours of the day and night. Let us give you prices on delivery of orders and other business at Detroit. Engineers and firemen, mates and deck hands, furnished on short notice.

Office Foot of Woodward Ave.

Tel. Main 46 B.



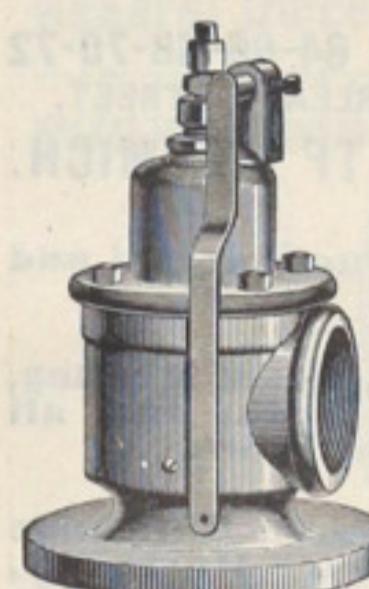
DELTA METAL



THE PHOSPHOR BRONZE SMELTING CO. LIMITED,
2200 WASHINGTON AVE. PHILADELPHIA.
"ELEPHANT BRAND PHOSPHOR BRONZE"
INGOTS, CASTINGS, WIRE RODS, SHEETS, ETC.
— DELTA METAL —
CASTINGS, STAMPINGS AND FORGINGS.
ORIGINAL AND SOLE MAKERS IN THE U.S.

PROPELLERS.

CROSBY STEAM GAGE AND VALVE CO.



CROSBY POP SAFETY VALVES. Locomotive, Marine and Stationery.
CROSBY WATER RELIEF VALVES, for Pumps, Hydrants, etc.
CROSBY IMPROVED STEAM PRESSURE GAGES.
CROSBY STEAM ENGINE INDICATORS, with Sargent's Electrical Attachment for taking any number of Diagrams simultaneously.

The Original SINGLE BELL CHIME WHISTLES.
BRANDEN PUMP VALVES; rubber with wire-coil insertion.
BOSWORTH FEED-WATER REGULATOR, PATENT GAGE TESTER, and many other specialties in Steam Lines.

Main Office and Works:

Boston, Mass.

Stores: Boston, New York, Chicago, and London, Eng.

WE WILL REPAIR YOUR STEAM FITTINGS PROMPTLY.

ALL RELIABLE statistics relating to shipping are contained in the Blue Book of American Shipping. Price, \$5. MARINE REVIEW, Cleveland.